Mineral Industry Report 1986-87 Northwest Territories

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CHAPTER 1
INTRODUCTION

W.A. Padgham
Chief Geologist

Mineral Industry Reports (MIR) for the Northwest Territories have been produced by the NWT Geology Division of Indian and Northern Affairs since DIAND assumed full responsibility for territorial mineral resources in 1969. This, the 16th volume in the MIR series, describes mining and documents mineral exploration in 1986 and 1987. Property write-ups were prepared by NWT Geology Division staff from information obtained from assessment reports which are held in the Geology Archives, augmented by personal observations. All assessment reports are indexed in the GEOSCAN data base, a system that contains bibliographic information on most government geological reports and reports reporting on exploration for oil and gas on Canada lands in NWT. The document number listed under references for each write-up can be used to access the assessment report in the Geology Archives and to order microfiche copies of the report.

NWT GEOLOGY DIVISION FUNCTIONS AND ACTIVITIES

The NWT Region of the Northern Affairs Program of DIAND is responsible for the administration of all mineral resources in the NWT, excluding oil and gas. The Geology Division, under this authority, acts much as a Provincial Geological Survey. Oil and gas resources are administered by COGLA (Canada Oil and Gas Land Administration). Transfer of this responsibility to the NWT Government is now being negotiated.

To fulfil its mandate, the NWT Geology Division:

1. Maintains a geological data base to assist in the furtherance of mineral exploration and development.
2. Monitors mining and mineral exploration, provides drilling authorities and monitors diamond drilling as required by the Canada Mining Regulations.
3. Reviews technical assessment work submitted to the Mining Lands Division.
4. Provides advice and assistance to individuals or organizations interested in NWT mineral resources and geology.
5. Expands geological knowledge of the NWT, its mineral deposits and mineral potential.

In 1986 the division budget to pursue these goals was approximately $1.3 million, made up of: salaries $703,000, for 12 permanent employees; capital $135,000; operating funds $600,000; and minor funds received under special programs for summer student employment. The 1987 budget was essentially the same.

SUMMARY OF MINING

Eight mines operated in the Northwest Territories in 1986 and 1987. Mine and metal production figures are given in Chapter 2. Although three mines closed, there are proposals to bring a number of gold properties to production by 1990.

Continued low prices of mineral commodities, other than gold and platinoids, adversely affected many areas of the NWT mineral economy. Gold and PGE exploration and development expanded significantly, while uranium and base metal exploration declined precipitously.

Pine Point Mines Ltd. announced plans to cease mining by the end of 1987. Higher grade material was processed in an attempt to maintain profitability. Mining ceased at Pine Point at the end of June 1987 and the mill and town of Pine Point were dismantled in 1988.

Tungsten production at Cantung Mine ceased on May 20, 1986 because of a labour dispute. On August 12, 1986 Cantung closed, primarily because of steadily decreasing tungsten prices. The mine, mill and town of Tungsten were mothballed in anticipation of future reopening but at the time of writing (March 1989) tungsten prices were still too low to allow production to resume.

In spite of low lead and zinc prices Nanisivik performed well, and with high prices in 1988-89 the mine life should be extended well beyond its originally projected 12 years. The Federal Government sold its 18% equity interest in Nanisivik Mines Ltd. to Mineral Resources International in 1986.

Cominco Ltd. was sold by Canadian Pacific Ltd. to a consortium comprising Teck Corp. of Vancouver, Metallgesellschaft (Canada) Ltd. and MIM (Canada) Ltd., both of Toronto, and the Con Mine was sold by Cominco Ltd. to NERCO-Con Minerals of Alaska in December 1986.

NERCO-Con increased exploration considerably in areas of the mine that have been out of production for many years.

Pamour Porcupine purchased the Falconbridge interest in Giant Yellowknife Mines. Production in 1986 at Giant Mine was from the open pits and the UBC and GKP zones. In 1987 production was from ASD, GB, UBC and from three open pits. A ramp was driven from surface to the 1200-foot level.

Ore from Treminco Resources Ltd.'s Tom Mine was processed at the Giant Yellowknife mill in 1987. Ptarmigan Mine was acquired by Treminco from Cominco Ltd. and was being developed for production which began in 1988. A decline to the 250-foot level was completed in November.

Mining ceased at Salamita Mine in mid-February 1987 and the mine was allowed to flood. Milling continued until the end of April. Giant Bay Resources treated 330 t of tailings from Giant's RED 24 claim in a bio-tank-leach pilot plant. This circuit increased gold recovery from the refractory ore to over 95.6%, compared with 65% using conventional milling. A 9.67 kg dore bar was produced.

Development at Lupin Mine in 1986 confirmed the extension of the centre zone to a depth of 650 m. In 1987 a new hoist, capable of operating to 1200 m, was installed. The cut-off grade was lowered to 10.5 g/t from 11.1 g/t Au early in the year and tonnage increased to 1727 t/day from 1600 t/day.

In December 1987, Neptune Resources announced plans to bring the Colomac property to production.

SUMMARY OF MINERAL EXPLORATION

The level of exploration for gold, base metals and uranium in 1986 was comparable to that of 1985. Expenditures for mineral exploration were in the range of $50 million on at least 130 properties.

Exploration expenditures almost doubled in 1987 to $90 million spent on at least 117 properties, 63 of which were diamond drilled. The expenditures in 1987 were determined by an NWT Chamber of Mines telephone survey and appear to be the most accurate and complete figure compiled for any year so far.

The focus of mineral exploration has shifted significantly in the past eight years. In 1980 more than half the properties explored had only uranium potential and base metals were a more preferred target than gold (Table 1-1). Since then, gold has been the predominant target and exploration for silver, base metals and uranium has declined to insignificance.

PLATINUM, URANIUM, BASE METALS, SILVER, BERYLLIUM

There was an increase in the number of platinum exploration projects but a decline in the number of rare metal exploration projects.

Staking of ultramafic rocks for platinum group elements (PGE) provided a new thrust in exploration. Claims now cover: the Muskox Intrusion, where diamond drilling was conducted in 1986 and 1987; the Duck Lake sill, east of Yellowknife; the Rankin Inlet copper-nickel deposit; and areas adjacent to Canico's Ferguson Lake nickel-copper deposit in south-central Keewatin. Drilling on copper-nickel showings, found a few years ago near Rutledge Lake, was probably encouraged by the PGE potential of those showings.

Interest in PGE continued in 1987 and by the end of the year most ultramafic rocks identified in the NWT had been staked.

Urangesellschaft, PNC (Power Nuclear Corporation of Tokyo) and CEGB (Central Electric Generating Board) continue to explore for uranium. Total expenditures were close to $5 million in 1986 but only $3.5 million in 1987.

Base metal exploration was mainly confined to areas adjacent to or within producing mines: Pine Point, Polaris and Nanisivik. Expenditures on base metal exploration declined to about $3.5 million in 1987 from about $5 million in 1986.

Silver-base metal exploration expenditures increased following the discovery of a volcanogenic silver-base metal deposit by Aber/Hemisphere joint venture in fall 1987. The Sunrise Lake deposit is near Sunset Lake on the Beaulieu River 85 km east-northeast of Yellowknife.

Procan Resources gained control of the Prairie Creek (Cadillac) silver-base metal deposits, but this operation is not likely to start up until metal prices improve.

Highwood Resources and Hecla Mining joined forces in 1986 to develop the Thor Lake beryllium-rare earth deposits.

GOLD EXPLORATION

Gold was the bright spot in mining and exploration as gold price rises during 1986 sparked higher interest in the yellow metal.

In 1986 the Bullmoose, Tom and Giant Bay gold properties were explored underground. Drilling continued on Echo Bay's Indin Lake deposits (Lex and Cass) and on Noranda/Getty's Tundra Project. Canuc Resources continued to drill on their Coronation Gulf property. Aber Resources obtained good grades and widths in drilling on the BUGOW property, which is just north of Fort Rae.

Cominco, Back River Joint Venture, Bow Valley and many junior companies, including Silver Hart and Welcome North, explored for iron formation-hosted gold deposits in the extensive turbidite domains of the central and northeastern Slave Province. BHP-Utah Mines worked in many parts of the Slave.

The gold search also intensified in the Keewatin, where Asamera, Borealis and Comaplex were active.

Expenditures on gold exploration in the NWT probably exceeded $25 million during 1986; more than 80% of this was in the Slave Structural Province.

In 1987 gold was again the main exploration target, with about $80 million spent on the search for this commodity. Many of the properties explored in 1986 were worked again in 1987.

Gold exploration expanded in the Slave where more than $50 million was spent in 1987. Expansion was even more dramatic in the Keewatin where expenditures on gold exploration more than doubled from 1986 to nearly $20 million in 1987.

In the Keewatin, work was concentrated in the 350 km long Rankin-Ennadai greenstone belt. Borealis Exploration Limited explored the Fat Lake Zone from underground and extracted and milled a 3000 t bulk sample. Noble Peak Resources, Sunmist Energy, Canadian Nickel Company and Homestake Development diamond drilled some of their properties, and smaller grassroots programs were done by at least three other companies.

TABLE 1-1: EXPLORATION PROJECTS BY TARGET COMMODITY

COMMODITY	AGE OF MAIN HOST ROCKS (GEOLOGICAL PROVINCE)	1981	1982	1983	1984	1985	1986	1987
Gold	ARCHEAN (Slave & Kaminak Subprov.); placer in Nahanni	48	25	53	78	95	105	102
Uranium	PROTEROZOIC (Bear & Churchill)	104	36	26	16	8	6	3
Silver	PROTEROZOIC (Bear)	8	3	9	3	4	0	0
Base Metals	all ages (+ Ag in Slave)	37	30	19	15	10	9	3
Rare Metals	ARCHEAN/PROTEROZOIC/CRETACEOUS (Slave-Bear-Cordillera)	12	15	7	3	15	9	9
Coal	CRETACEOUS/TERTIARY	0	2	1	1	0	0	0
MISCELLANEOUS		9	2	1	1	7	1	0
TOTALS:		218	113	116	117	139	130	117

The following describes the more important Slave Province projects done in 1987. In the Courageous Lake area, Getty Resources and Noranda Exploration spent more than $8 million drilling to outline the Fat Zone, which is hosted in sheared felsic volcaniclastics. Results of deep drilling (>500 m) were as encouraging as those of shallower drilling (150 m) which outlined reserves of about 1.25 Mt grading 9 ppm Au. In a press release issued in late December, Getty Resources estimated possible geological reserves at the Tundra project to be 8.4 Mt grading 8.9 g/t Au. An underground exploration program underway in 1988-89 is expected to cost more than $30 million.

In the Indin Lake area, Neptune Resources spent more than $7 million to vat leach low-grade gold-bearing rock from the Colomac Dyke, a quartz-albite intrusion. The Colomac Dyke includes one zone containing 13 Mt grading 1.5 ppm Au, as well as five other zones of somewhat smaller size but similar grade. In December, Neptune Resources announced their intention of bringing the Colomac property to production by the early 1990's.

In the Indin Lake area projects were underway by joint ventures comprising Echo Bay Mines Limited/Petromet Resources/Comaplex, and Mahogany Resources/Treasure Island Resources. The Echo Bay joint venture outlined two deposits, the Kim Zone, in mafic flows and Cass Zone, in a gabbro sill.

In the Contwoyto Lake area, Cominco obtained encouraging results from three holes drilled in iron formation on ground about 30 km southeast of Lupin Mine. Each hole intersected 3 to 4 m grading 12 to 40 ppm Au.

In the Yellowknife area, Treminco Resources spent about $3 million to rehabilitate the Ptarmigan Mine, a turbidite-hosted quartz-vein deposit with proven reserves of 150 kt grading 10 to 11 ppm Au. Three other turbidite-hosted quartz-vein deposits in the sedimentary basin east of Yellowknife are in the underground exploration stage: the Kidney Pond Zone (Giant Bay Resources); the WT deposit (Westfort Petroleum); and the Lambert Vein (Lightning Minerals).

Giant Yellowknife Mines Limited announced it will spend about $25 million at Yellowknife to construct a plant to treat 6.3 Mt of tailing grading 2.3 ppm Au. This plant was commissioned in the spring of 1988.

In the Russell Lake Basin, northwest of Yellowknife, auriferous iron formations similar to Lupin were evaluated by Aber Resources, Freeport McMoran and others.

EXPLORATION LEVEL INDICATORS

Measuring the level of mineral exploration relative to that of other years is complex. Dollars spent is only one measure; other parameters include the number of properties explored, the number of properties drilled, the amount of core drilled, the area of claims staked and the number of prospecting permits issued. Each criteria provides a measure of exploration and permits comparison of one year's activities with those of other years.

EXPENDITURE ON EXPLORATION

Exploration expenditure is the most difficult parameter to estimate. Figures on what has actually been spent on the ground are difficult to determine when reported amounts include overhead and head office expenditures or property acquisition costs (option payments).

Figure 1-1 shows expenditures estimated for various years. A record high was reached in 1987 with similar expenditures expected in 1988. Flow-through share financing was an important source of funds for this surge, but the success of gold mining, particularly at Echo Bay's Lupin mine, and the discovery of the Noranda/Getty (now Noranda/TOTAL Energold) Tundra property have also contributed.

PROPERTY ACQUISITION

In 1986, 358 829 ha were staked, a 5-year record high and an increase of 64% relative to 1985 (Table 1-2). About 80% of the ground staked is in the Mackenzie District (mainly in the Slave Structural Province) and about 20% is in the Keewatin District, Rae and Hearne Provinces. The principal target in both areas is gold. No claims were staked in the Cordilleran (Nahanni District) and few were staked in the other mining districts of the NWT. Table 1-2 compares 1986 and 1987 staking to that in other years.

In 1987 a minor staking boom took place in areas of gold potential, mainly in the Slave Structural Province (Table 1-2). Over 372 397 ha (600 claims) were staked in the Slave, and 88 919 ha (108 claims) in the Keewatin.

Staking for volcanogenic silver and lead-zinc took place in the Sunset-Beaulieu River volcanic belt, and in the Bear Province (along the Fault River) for the platinum potential of long-known uranium showings.

In spite of increased staking (552 000 ha were staked in 1987), total area of claims in good standing in the NWT increased only slightly as 430 656 ha of claims lapsed.

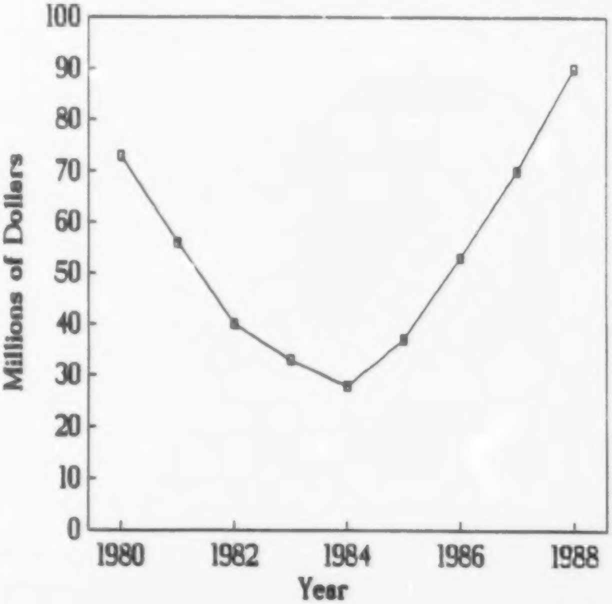

FIGURE 1-1: Graph showing exploration expenditures for the years 1980 to 1988.

TABLE 1-2: AREA STAKED IN HECTARES IN THE VARIOUS GEOLOGICAL TERRANES OF THE NWT 1976-1987

DISTRICT	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Arctic Islands	0.9	1.4	82.1	16.0	9.7	3.0	22.8	4.0	29.4	0.5	1.0	0.0
Keewatin[1]	214.0	108.0	620.0	438.8	518.1	323.2	65.0	52.6	25.0	49.9	71.9	88.9
SE Mackenzie[1]	30.4	78.7	314.0	322.1	175.5	82.5	18.4	31.3	12.5	8.7	1.0	21.9
Slave Province	62.2	67.8	53.9	35.6	51.0	153.3	20.7	218.5	161.2	231.3	209.5	372.4
East Arm[2]	1.5	2.1	2.6	11.1	0.02	11.2	0.1	-	-	0.1	5.7	0.6
Bear Province	45.0	170.0	84.6	171.8	40.0	21.0	6.7	13.3	0.2	1.2	67.2	67.1
Pine Point[3]	49.2	5.6	255.3	131.9	13.5	2.5	0.7	0.1	10.4	-	2.5	0.2
Cordillera	8.2	19.9	19.0	14.4	25.2	12.9	25.0	11.6	2.2	1.8	-	0.8
TOTALS:	**411.4**	**453.5**	**1431.5**	**1141.7**	**833.02**	**609.6**	**159.4**	**331.4**	**240.9**	**293.5**	**358.8**	**551.9**

[1] Churchill Province
[2] Bear Province
[3] Interior Platform

CLAIMS IN GOOD STANDING

Under the present Canada Mining Regulations, mineral claims can contain from one to fifty 20 ha units. One unit is 1500 feet (approximately 500 m) square. Prior to 1979 only single 1500 foot square claims could be staked. As a result of this change, although fewer claims are now staked each year, much larger areas are covered by each claim.

Most of the single unit claims will soon, or have already lapsed, because claims lapse after 10 years unless they are taken to lease.

Table 1-3 compares claims and areas staked, lapsed and in good standing since 1983. It shows that there has been little net change in the area staked but the number of claims is less than half (41%) of what it was in 1983.

PROSPECTING PERMITS

The intent of Prospecting Permits is to encourage exploration in high cost areas which have had little mineral exploration. In the last few years, with the shift of exploration to gold and with its concentration in the Slave and Hearne (SE Churchill) Structural Provinces, fewer prospecting permits have been applied for, and, because of the intensity of exploration interest, fewer applications have been approved.

Table 1-4 shows the changes in number and distribution of prospecting permits over the past 14 years. Figures for 1988 and 1989 are added to show the trend to fewer permits.

TABLE 1-3: MINERAL CLAIMS IN THE NWT 1983 to 1987

		Claims (Hectares)	
Year	**Recorded**	**Cancelled**	**Good Standing**
1983	547 (330,592)	424 (703,289)	40,952 (3,114,606)
1984	488 (240,900)	4,222 (472,323)	36,528 (2,878,225)
1985	461 (294,887)	6,565 (455,237)	30,398 (2,704,790)
1986	531 (360,361)	5,655 (339,468)	25,226 (2,721,985)
1987	843 (552,385)	6,031 (430,657)	20,052 (2,829,403)

Prospecting permits were first issued in the late 1960's and in 1987 the 1115th permit was issued. As can be seen from Table 1-4, permits are far less popular than they were during the last uranium exploration boom.

In 1986, 18 permits were relinquished or expired; in 1987, 45 were relinquished or expired.

TABLE 1-4: PROSPECTING PERMITS ISSUED 1976 TO 1987 IN VARIOUS GEOLOGICAL PROVINCES

AREA	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Arctic Island	0	0	10	0	10	2	53	87	10	15	0	0	0	3
Cordilleran Province	1	0	5	6	11	9	12	7	0	0	0	1	0	0
Churchill Province	53	25	50	72	57	54	17	1	10	11	29	5	37	18
Bear Province	13	8	10	36	17	4	3	0	0	5	2	0	0	0
Slave Province	1	1	0	0	3	4	6	1	5	22	0	0	8	3
TOTALS:	**68**	**34**	**75**	**114***	**98**	**73**	**91**	**96**	**25**	**53**	**31**	**6**	**45**	**24**

* In previous Mineral Industry Reports only 99 permits were reported issued.

TABLE 1-5: COMPARISON OF ACTIVITY IN VARIOUS GEOLOGICAL PROVINCES AND SUBPROVINCES

	NUMBER OF PROJECTS EACH YEAR										
GEOLOGICAL REGION	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Cordillera	13	14	21	29	24	12	11	11	7	4	2
Arctic Islands [1]	6	8	4	7	24	16	11	17	13	6	1
Keewatin [2]	38	36	48	53	59	34	25	19	17	21	17
SE Mackenzie [3]	11	7	13	14	25	10	11	9	3	1	6
East Arm	2	7	6	4	14	3	1	1	2	1	4
Pine Point	3	7	5	6	6	3	2	1	2	1	1
Bear Province	35	32	32	22	24	10	11	2	3	6	3
Slave Province	28	29	33	29	42	25	44	57	92	90	89
TOTALS:	**136**	**140**	**162**	**164**	**218**	**113**	**116**	**117**	**139**	**130**	**117**

[1] Includes Baffin Island and Melville Peninsula, part of the Churchill Province, as well as the Arctic Archipelago

[2] Churchill Structural Province

[3] Churchill Structural Province in District of Keewatin

TABLE 1-6: HIGH COST PROJECTS (DRILLING, MINE DEVELOPMENT)

	YEAR									
	78	79	80	81	82	83	84	85	86	87
Drilling	52	61	81	58	45	54	29	35	34	63
Underground Development	2	4	6	12	5	8	4	3	3	2
Mines in Development										5
Producing Mines	7	8	9	11	12	12	11	9	8	8
TOTALS:	61	73	96	81	62	74	44	47	45	78

TABLE 1-7: SUMMARY OF DRILLING 1986 & 1987 [1]

BY DISTRICT	**1986**	**1987**
Franklin (Arctic Islands)	28,866.5	28,504.0
Keewatin	20,622.8	32,867.5
Mackenzie	108,322.6	128,868.5
BY GEOLOGICAL PROVINCE		
Slave	78,047.9	108,716.8
Bear	1,555.0	3,169.2
Churchill	46,904.3	46,964.5
Cordilleran	--	244.5
Interior Platform	26,660.2	15,348.2
Innuitian	10,044.5	15,797.5
BY COMMODITY		
Uranium	13,443.7	8,664.1
Base Metals	60,526.7	43,852.2
Precious Metals	85,226.9	133,164.7
Tungsten & Rare Metals	1,325.6	--
Platinum Group Elements	2,288.9	4,559.1
SURFACE DRILLING	119,961.5	140,101.1
UNDERGROUND DRILLING	42,850.4	50,138.9
TOTAL DRILLING	**162,811.9**	**190,240.1**

[1] All figures are in metres

PROPERTIES EXPLORED

The number of properties explored is an important measure of activity. Table 1-5 shows the number of properties explored each year since 1975 and their distribution among the geological subdivisions of the NWT.

There was a 10% decrease in the number of properties explored between 1986 and 1987 but a significant increase in total exploration expenditures and a 54% increase in staking. (Properties staked are not included under properties explored in Table 1-5 unless more than prospecting was done on them.)

HIGH COST PROJECTS

A significant increase in expenditures in 1987, partly a result of funds raised in flow-through financing, is reflected in the significant increase in high cost projects over 1984 to 1986 (Table 1-6).

The Canada Mining Regulations require that the Engineer of Mines for drilling be advised prior to the commencement of mineral exploration drilling. Also, the regulations require that a summary report giving the number of holes, the metres drilled and the sites of the holes be provided on a "Form 20". The data provided by industry is a useful exploration parameter. It is compiled in Table 1-7. The data in this table is probably somewhat low because some projects have not been reported.

SUMMARY OF GEOLOGICAL WORK

CONDUCTED BY THE NWT GEOLOGY DIVISION

Geology Division staff worked on numerous projects during 1986 and 1987. Many were continuations of multi-year projects.

Open file reports on most of these projects are available from the NWT Geology Division Archives.

1. RUSSELL LAKE 85 J/13, 85 O/4

Project Geologist V.A. Jackson began mapping supracrustals that contain iron formation-hosted gold deposits. The first year of this multi-year detailed mapping project was 1986.

2. HOOD RIVER 76 L
Under the direction of Project Geologist V.A. Jackson, this is a continuation of a long-term project to map the southern extension of the High Lake volcanic belt. In 1986 76 L/10, 15 and 16 were mapped. In 1987 76 L/9, 11, 12 and 13 were mapped.

3. SURFICIAL MAPPING
Glacial deposits in the Russell Lake and Hood River areas and end-glacial marine sediments of the Arctic coast. Paulatuk to Kent Peninsula are being mapped by D. Kerr (now at the University of Alberta) in concert with bedrock mapping by Jackson.

4. HOPE BAY 77 A
Ultramafic sills and basaltic volcanics in the Hope Bay volcanic belt were mapped by W.A. Gibbins, Arctic Islands District Geologist. (This work was continued in association with the Canada-NWT Mineral Development Agreement, beginning in 1988.)

5. OCTOPUS FORMATION 85 J/7, 8
Mapping of south end of Yellowknife volcanic belt was completed in 1986 by K. Pelletier, Carleton University.

6. ELLINGTON LAKE 86 E/11
Mapping of a Bear Province supracrustal, mainly volcanic, belt was completed in 1986 by K. Pelletier, Carleton University. An M.Sc. was completed in 1988.

7. JACKFISH ISLAND 85 J/1, 8
D. Roach, Carleton University, completed in 1987 1:10 000 mapping of the southeastern part of the Yellowknife Bay area, where the southeast end of Yellowknife volcanic belt, Duck and Burwash formations are exposed.

8. CAMERON RIVER VOLCANIC BELT 85 I/15
Detailed (1:10 000) mapping to elucidate structure and stratigraphy of the Fenton Lake and adjacent areas of the Slave Province were conducted by R. Cullen, Carleton University. Field work was completed in 1987, an M.Sc. in 1988.

9. CAMERON RIVER VOLCANIC BELT/SLEEPY DRAGON METAMORPHIC COMPLEX 85 I/15
Structural mapping to determine the relations of volcanics of the Yellowknife Supergroup to the basement complex was conducted by T. Kusky, John Hopkins University, W. Kidd, SUNY, Albany, and C. Isachsen, Washington University, St. Louis. The field work was completed in 1987.

10. POINT LAKE AREA (KESKARRAH BAY) 86 H/7
Structural mapping to determine the relation of Yellowknife Supergroup volcanics to the basement complex was continued in 1986 and 1987 by T. Kusky, John Hopkins University, W. Kidd, SUNY, Albany, and C. Isachsen, Washington University, St. Louis.

11. KAM/BANTING TRANSITION
A study of the transition from the Kam Group to the Banting Group and the relation of the Jackson Lake Formation to these groups was completed by G. Bailey in 1986. An M.Sc. based on this work was completed in 1987 at Queen's University.

12. WESTERN PLUTONIC COMPLEX
Mapping of granitoids along the west side of the Yellowknife volcanic belt to investigate the granite/gold connection was begun in 1986 by D. Atkinson, University of Western Ontario. Field work continued in the summers of 1987 to 1990.

13. NONACHO BASIN
Dr. L. Aspler began, in 1986, 1:50 000 mapping of extensions of the Nonacho Group and collection of material for heavy mineral analysis and gold content. Work was completed in 1987.

14. GOLD VEIN STUDIES, YELLOWKNIFE BASIN
Detailed mapping of gold quartz veins in the Burwash Formation was begun by J.A. Brophy, District Geologist, and W.K. Fyson, University of Ottawa.

15. DEFORMATION STUDIES, YELLOWKNIFE BASIN
Detailed studies to clarify structural relations in the Slave Province were continued by W.K. Fyson, University of Ottawa.

16. DATING BEAR PROVINCE
Geochronological studies in Wopmay Orogen by S.A. Bowring, Washington University, St. Louis, continued in association with Dr. R. Hildebrand, GSC, Ottawa.

17. DATING SLAVE PROVINCE
Geochronological studies in many parts of Slave Structural Province to improve maps and relate the mineral deposits to structural events were conducted by W.A. Padgham, NWT Geology Division, in cooperation with S.A. Bowring and R.I. Thorpe, GSC, Ottawa.

18. MINERALOGICAL STUDIES, THOR LAKE
Mineralogical studies of the Thor Lake rare metal deposits (Lake Zone) were underway by D.W.G. Smith and R. Pinckston, University of Alberta. Field work was completed in 1987.

19. PINE POINT MINES
Geology and mineralogy of N-81 ore body, Pine Point Mines, were under investigation by S. Foster under direction of R.D. Morton, University of Alberta. Field work was completed 1987 and an M.Sc. thesis completed 1988.

20. INGRAHAM TRAIL 85 I, J
District Geologist, J.B. Seaton commenced 1:10 000 geological mapping in the Tibbitt Lake area.

21. BENIAH LAKE 85 P/8
Detailed studies of the volcanic stratigraphy and structure in the Beniah Lake area were begun by D. Roach, University of Ottawa.

22. YELLOWKNIFE BAY FORMATION, LAM GROUP
Studies of sediment-volcanic flow relations in the Yellowknife Bay Formation were begun by H. Falck, J.A. Donaldson, and G. Potts in 1987.

23. PEGMATITE STUDIES
Mineralogical studies of rare element-bearing pegmatites in the Yellowknife Pegmatite Field were continued by P. Cerny and M.A. Weiss, University of Manitoba.

24. GEOCHRONOLOGICAL STUDIES
Geochronological studies in the Slave Province were conducted by C. Isachsen and S. Bowring, Washington U. of St. Louis.

MINERAL DEVELOPMENT AGREEMENT

In 1986 a Canada-NWT Mineral Development Agreement (MDA) was approved. This program is under the umbrella of the general Economic Development Agreement (EDA). Total expenditures under the MDA in the NWT over its life (1987 to 1991) will be $7 million. The Geological Survey of Canada's MDA-Geoscience program will consume $2.85 million and the NWT-Geoscience program will also expend $2.85 million. The remainder of the MDA funds will be spent assisting northern mining operators to improve their operating technology under the Northern Technology Assistance Program (NTAP) ($1 million) and expanding public awareness of the importance and the economic opportunities in the mining industry through the Northern Mining Information Program (NMIP) ($0.3 million).

Funds available in 1987 for the NWT-operated programs were only $176,000 and money was not available until late in the season. The NWT portion of the 1987 field program was, as a result, rather small scale. It included four contracts to support mainly university-supervised field work as shown in Table 1-8.

SERVICES AVAILABLE FROM THE NWT GEOLOGY DIVISION

The NWT Geology Division of DIAND operates from Yellowknife where the following services are offered to those interested in the geology and non-renewable resources of the NWT.

An Archives and Geological Library contains copies of most federal government documents on the geology of the NWT and many government publications on the mineral industry of the NWT and Canada. A small library of NWT aerial photography is available. A 16 mm cassette system of air photo negatives providing coverage for all of the NWT is also available in the nearby office of the Regional Surveyor (EMR, Canada). The NWT Region Natural Resources Technical Library also maintains a broad spectrum of current journals and texts on geology, mineral deposits and mineral exploration. A small but steadily expanding library of theses on the geology of the NWT is also maintained for the Geology Division by the Technical Library.

Assessment work reports for most of the mineral exploration done in the Territories are available in both the original format and on microfiche. Oil and gas exploration reports are available on microfiche. Access to the GEOSCAN-Minisis data base, a bibliographic index to geological information on NWT, is available through the Division's computers.

For many years the Geology Division has reviewed periodicals for information on NWT mining properties. An archive of journal articles on geology relevant to the NWT continues to be developed.

A facility, the C.S. Lord Core Library, is maintained for the storage, examination and processing of drill cores and rock samples.

Advice to the public, rock and mineral collectors, prospectors and the mineral industry is available from a staff of 12 (as of 1989), which includes 8 geologists and 4 support staff.*

Claim maps and property ownership maps are available for inspection or purchase from the Northern Affairs Program Drafting Section through the Mining Recorder's office. Topographic maps and some aeromagnetic and geological maps can be purchased from the Regional Surveyors' office (EMR). Most are on file in the NWT Geology Division Archives geological and geophysical maps.

The Geology Division in Yellowknife is a repository for Geological Survey of Canada (GSC) releases on the geology, mineral deposits and the mineral industry of the NWT. Most GSC publications are available for examination or loan; most GSC open files germane to the NWT are available for purchase. In addition numerous open file reports and maps on the geology of NWT produced by division staff and contractors can be obtained from the Geology Division. Since 1988, NWT-MDA open files have also been made available through the Geology Division's open file system.

GEOLOGY DIVISION PUBLICATIONS

The NWT Region Geology Division produces numerous publications each year which can be obtained from the Geology Archives, DIAND, Box 1500, Yellowknife, XIA 2R3. A list of available publications and reprints, and the cost of each, is also maintained by the Archives.

The Geology Division produces yearly overviews of mining exploration and geological survey work, a preview of mineral exploration and of geological mapping, and numerous open file releases; 15 were produced in 1986, 12 in 1987 and 15 in 1988.

TABLE 1-8: 1987 CANADA-NWT MINERAL DEVELOPMENT AGREEMENT FIELD PROGRAM

UNIVERSITY PROFESSOR/STUDENT	AMOUNT (Thousand)	PROJECT
University of Toronto Professor E.T.C. Spooner Student: Andy Abraham (Ph.D.)	$20	Detailed mapping and studies of gold-quartz veins in granitoids in the northern Slave Province (mainly Anialik River area, NTS 76 M/11 and 14). This work will be co-ordinated with memoir preparation for the Hepburn Island area, 76 M (V. Jackson *et al.*).
Dalhousie University Professors M. Zentilli & N. Culshaw Student: Tim Stokes (Ph.D.)	$10	Study of Knight Bay-type turbidite-hosted gold deposits (Gordon Lake area, NTS 85 I/14, 85 P/13). This work will be co-ordinated with detailed structural studies of the Slave Province (Fyson) and studies of turbidite-hosted quartz veins (Brophy).
University of Ottawa Professor W.K. Fyson Student: Dan Roach (Ph.D.)	$25	Mapping of the Beniah Lake straight zone to determine its relationship to the evolution of the Beaulieu River supracrustal belt and its potential as a locus for gold mineralization. Geological maps of the supracrustal (mainly volcanic) belt will be generated. Work will be co-ordinated with MDA mapping (Carp Lake-Tundra area mapping project).
University of Manitoba Professor P. Cerny, Dr. Weiss (post Doc.) and various students	$20	Studies of rare element pegmatites of the NWT to map and characterize significant rare element pegmatites and produce reports on the mineralogy and petrology.

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* *As a result of Federal Government restraint the staff of the NWT Geology Division was cut by 8.33% in 1989 resulting in the loss of the manager of the Core Library.*

More formal publications include this Mineral Industry Report which provides archival data on mineral exploration in the NWT. It is produced biannually. Papers on the geology of the NWT, mainly reports on work done by university researchers supported by the NWT Geology Division, are now published in Contributions to the Geology of NWT, a referred journal produced from time to time by the Division. Division staff also publish in professional and mining industry journals.

In addition to Geology Division releases, numerous out-of-print Geological Survey of Canada geological maps of the NWT can be obtained in the form of ozalid prints, and numerous papers and reports by contractors and others are also available. These are all in the list of publications.

Publications released since the last Mineral Industry Report was produced are listed below.

RECENT PUBLICATIONS

Available from:

NWT GEOLOGY DIVISION
NORTHERN AFFAIRS PROGRAM
DIAND
Box 1500, Yellowknife
Northwest Territories
XIA 2R3

Mineral Industry Report, 1984-85, Northwest Territories; by J.A. Brophy, J.C. Crux, W.A. Gibbins, P.J. Laporte, W.A. Padgham and J.B. Seaton; C.E. Ellis, editor (1987); NWT Geology Division, DIAND, Yellowknife, NWT. (N/C)

Contributions to the Geology of the Northwest Territories, Vol. 3; W.A. Padgham, editor (1988), NWT Geology Division, DIAND, Yellowknife, NWT. (N/C)

EGS 1987-1 Exploration Preview, NWT-1987; by geological staff; C.D. Gault, editor; NWT Geology Division, DIAND, Yellowknife, NWT; 1 text, 9 p. (N/C)

EGS 1987-2 Geology of Tent Outlier; Nonacho Basin, parts of NTS 75 J/5, 10, 11, 12, 14, 15; scale 1:50,000; by L.B. Aspler; 1 map (unedited). ($3.00)

EGS 1987-3 Geology and structure of the Cameron River Belt, Fenton Lake area, parts of NTS 85 I/15, P/2; scale 1:10,000; by R.D. Cullen; 2 maps with marginal notes. ($10.00/set, $5.00 each)

EGS 1987-4 Structure and geology of the Wilson Island Group, parts of NTS 75 L/3, 4, 85 H/10, 11, 14, 15; scale 1:25,000; by B.J. Johnson; 5 maps with marginal notes. ($15.00)

EGS 1987-5 Geology of the Bell Island Group, Hottah Lake area, parts of NTS 86 E/1, D/16; scale 1:25,000; by I. Reichenbach; 1 map. ($5.00)

EGS 1987-6 Proceedings of the Seminar on Native Participation in Mining, March 18 and 19, 1987, Yellowknife, NWT; 1 text, 133 p. ($6.70)

EGS 1987-7 Carvingstone and Inuit Carvings: Unique Northern Canadian Resources; by W.A. Gibbins; 1 text, 36 p. ($2.00)

EGS 1987-8 Preliminary Geological Map of the Arcadia Bay Property/Coronation Gulf, NWT; part of NTS 76 M/11; scale 1:15,000; Canada-NWT Mineral Development Agreement; by A.P.G. Abraham; 1 map and 1 text, 28 p. ($3.50)

EGS 1987-9 Preliminary Geology of Beniah Lake area; NTS 85 P/8; scale 1:50,000; compiled by W.A. Padgham; 1 map with marginal notes. ($4.00)

EGS 1987-10 Preliminary Geology of the Kathawachaga Lake area (North Half); NTS 76 L/9, 11, 12, 13; scale 1:50,000 (except 76 L/9 at 1:31,680); by V.A. Jackson, P. Chawrun, S. Edbrooke, H. Falck, C.D. Gault, A-M. Hamilton, D. Kerr, T. Mayor, J. McCorquodale and G. Potts; 4 maps and accompanying notes and legend. ($15.00/set, $3.00/each)

EGS 1987-11 Geology of the Russell Lake area; NTS 85 O/4; scale 1:50,000; compiled by V.A. Jackson; 1 map with marginal notes. Superseded by EGS 1988-11.

EGS 1987-12 Preliminary Geology: Hope Bay Volcanic Belt, Northern Portio parts of NTS 77 A/3, 6; scale 1:50,000; by W.A. Gibbins; 1 map with marginal notes. ($4.00)

EGS 1988-1 Exploration Preview, NWT-1988; by geological staff; C.D. Gault, editor; NWT Geology Division, DIAND, Yellowknife, NWT; 1 text, 16 p. (N/C)

EGS 1988-2 Geology of the Southeast part of Yellowknife Bay, part of NTS 85 J/8; scale 1:20,000; by D. Roach; 1 map with marginal notes. ($5.25)

EGS 1988-3 Evaluation of Rare-Element Pegmatites in NWT; Preliminary, Progress and Final Reports, parts of NTS 27 C; 56 M; 75 M; 76 C; 85 I; & 85 J/1, 8, 9, 16; Canada - NWT Mineral Development Agreement; by P. Cerny; 3 texts, 128 p. ($6.50)

EGS 1988-4 Structural Mapping of the Gordon Lake 'Refold', NWT: A model for the focusing of late-stage gold bearing quartz breccia-vein systems, part of NTS 85 I/15 & 85 P/3; scale approximately 1:20,000; Canada - NWT Mineral Development Agreement; by Tim Stokes, Nicholas Culshaw and Marcos Zentilli; 1 map and 1 text, 28 p. ($3.00)

EGS 1988-5 Mineralogy of the Lake Zone, Thor Lake, NWT, part of NTS 85 I; by D. Robert Pinckston and Dorian G.W. Smith; 1 text, 13 p. ($0.75)

EGS 1988-6 Mineral Showings and Property Compilation, Southeast Barren Grounds, Districts of Keewatin and Mackenzie; parts of NTS 55, 56, 65, 66, 75, 76; scale 1:1 000 000; compiled by K. Griep; 1 map. Superseded by EGS 1989-13.

EGS 1988-7 Clastic Dykes in Volcanic Rocks of the Giant Section, Yellowknife, NWT, part of NTS 85 J/9; by Hendrik Falck and J.A. Donaldson; 1 text, 12 p. ($0.60)

EGS 1988-8 Mineral Occurrences of the Indin Lake area (north half), parts of NTS 86 B/3, 6; scale 1:50,000; Canada - NWT Mineral Development Agreement; by John Morgan; 1 map with marginal notes. ($3.00)

EGS 1988-9 Interim Field Report - Ennadai Lake Project; and, Sedimentology, Structure and Economic Geology of the Poorfish - Windy Thrust Fold Belt, Ennadai Lake area, Keewatin, parts of 65 C; Canada - NWT Mineral Development Agreement; by L.B. Aspler; 2 texts, 7p and 33p. ($2.00) (Enlarged figures also available upon request [$3.00])

EGS 1988-10 Property Compilation and Showings Map, Slave Structural Province, parts of NTS 75, 76, 85, 86; scale 1:1 000 000; by J.A. Brophy; 1 map. ($3.00)

EGS 1988-11 Geology of the Russell - Slemon Lakes area, NTS 85 0/4; scale 1:30 000; by V.A. Jackson; 1 map with marginal notes. ($4.00)

EGS 1988-12 Preliminary Geology of the Hurwitz Group, Kaminak Lake - Tavani area (Kaminak - Quartzite Belt and Whiterock Belt), parts of NTS 55 L/4, 7; K/4; scale 1:15 840 (1"=1/4 mile); Canada - NWT Mineral Development Agreement; by Judy Patterson; 3 maps. ($6.50)

EGS 1988-13 Stratigraphy and lithology of the Upper Ross Lake area, parts of NTS 85 I; by T.M. Kusky; 2 maps with marginal notes. ($6.00)

EGS 1988-14 Pegmatite Studies in the Alymer Lake area - a preliminary report, parts of NTS 75 M, 76 C, D; Canada - NWT Mineral Development Agreement; by P. Cerny, P. Tomascak and M.A. Wise; 1 text, 11 p. ($0.60)

EGS 1988-15 Report on Reconnaissance work in the M1, M2 and QULIK 1 Claims, Chantrey Inlet, NWT, parts of NTS 56 M/6; Canada Mineral Development Agreement; by P. Cerny, M.A. Wise, and P. Tomascak; 1 text, 39 p. ($2.00)

EGS 1988-16 Late Quaternary Marine Record of the Cape Parry-Clinton Point Region, District of Mackenzie, parts of NTS 97 C, D; in GSC Paper 1989-1, Current Research, Part D; by D.E. Kerr; 1 text, 12 p. ($0.70)

EGS 1989-1 Exploration Preview, NWT - 1989; by geological staff; C.D. Gault, editor; NAP Geology Division, NWT; 1 text, 17 p. (N/C)

EGS 1989-2 Pegmatite Studies in the Alymer Lake area, Northwest Territories, parts of NTS 75 M, 76 C, D; Canada - NWT Mineral Development Agreement; by P. Cerny, P. Tomascak and M.A. Wise; 1 text, 14 p. ($0.60)

EGS 1989-3 Reconnaissance of M1, M2 and QULIK 1 Claims, Chantrey Inlet, NWT, part of NTS 56 M/6; by P. Cerny, M.A. Wise and P. Tomascak; 1 text, 16 p. ($0.90)

EGS 1989-4 Analysis of Gossans, Exploration Guides, and Economic Evaluation, Poorfish - Windy Thrust/Fold Belt, Ennadai Lake area, District of Keewatin, part of NTS 65 C; Canada - NWT Mineral Development Agreement; by L.B. Aspler; 1 text, 43 p. ($2.20)

EGS 1989-5 The Kaminak Lake Alkaline Intrusion, parts of NTS 55 L; scale 1:17 000; Canada - NWT Mineral Development Agreement; by P.A. Cavell and H. Baadsgaard; 1 map and 1 text, 22 p. ($2.50)

EGS 1989-6 Tonalite-Hosted Au-Quartz Vein/Shear Zone Mineralization in the Arcadia Bay area, Slave Province, NWT, part of NTS 76 M/11; Canada - NWT Mineral Development Agreement; by A.P.G. Abraham; 1 text, 70 p. ($3.50)

EGS 1989-7 Preliminary Geology of the Torp Lake area, parts of NTS 76 N/5, 6; scale 1:30,000; Canada - NWT Mineral Development Agreement; by R. Johnstone; 1 map with marginal notes. ($3.00)

EGS 1989-9 Preliminary Geology of the Beniah Lake area; NTS 85 P/8; scale 1:30,000; Canada - NWT Mineral Development Agreement; by D. Roach; 1 map with marginal notes. Superseded by EGS 1990-2. ($3.00)

EGS 1989-10 Preliminary Geology and Mineral Occurrence Compilation of the Southern Half of the Hope Bay Metavolcanic Belt; parts of NTS 76 O/8, 9, 10, 15, 16 & 76 P/13, 14; scale 50 000; Canada - NWT Mineral Development Agreement; by J. Gebert; 1 map with marginal notes. (unedited)($3.00)

EGS 1989-11 Preliminary Geological Compilation of Hepburn Island Map area (76 M); scale 1:125,000; by V.A. Jackson; 1 map with marginal notes. ($5.00)

EGS 1989-12 Geology of the Spencer Lake area; parts of NTS 85 P/1, 2; scale 1:50,000; Canada - NWT Mineral Development Agreement; by M. Stubley; 1 map with marginal notes. Revised November, 1989. ($3.00)

EGS 1989-13 Mineral Showings and Property Compilation, Southeast Barren Grounds, Districts of Keewatin and Mackenzie; parts of NTS 55, 56, 65, 66, 75, 76; scale 1:1 000 000; updated by A. Enge; 1 overlay to EGS 1989-14. ($10.00 mylar; $4.50 paper)

EGS 1989-14 Mineral Potential and Geology of the Southeastern Barren Grounds, Districts of Keewatin and Mackenzie; parts of NTS 55, 56, 65, 66, 75, 76; scale 1:1 000 000; compiled by A. Enge; 1 map. ($4.50)

EGS 1989-15 Mineral Potential and Geology of Slave-Bear Structural Provinces, District of Mackenzie; parts of NTS 75, 76, 85, 86; scale 1:1 000 000; compiled by A. Enge; 1 map. ($3.00)

EGS 1989-16 Report on Preliminary Assessment of the Geology and Mineral Potential of the early Proterozoic Hurwitz Group, District of Keewatin; parts of NTS 55 L/4, 7 & 55 K/4; Canada - NWT Mineral Development Agreement; by J. Patterson; 1 text, 32 p. ($1.60)

EGS 1989-17 A Structural and Lithologic model for the formation of gold bearing quartz breccias at Gordon Lake, NWT; parts of NTS 85 I/15 & 85 P/3; scale approximately 1:20,000; Canada - NWT Mineral Development Agreement; by T. Stokes, M. Zentilli and N. Culshaw; 1 map and 1 text, 33 p. ($3.00)

EGS 1989-19 Geological Map of the Arcadia Bay area, Coronation Gulf, NWT; parts of NTS 76 M/11; scale approximately 15 000; Canada - NWT Mineral Development Agreement; by A.P.G. Abraham; 1 map. ($4.00)

EGS 1989-20 NWT - Cordilleran Region, Mineral Potential; parts of NTS 95, 96, 106; scale 1:2 500 000; compiled by D. Atkinson; 1 map ($2.00)

EGS 1989-21 Preliminary Geology of the Pistol Bay area, parts of NTS 55 K/1, 2, 6-11; scale 1:30 000; Canada - NWT Mineral Development Agreement; by S. Goff; 2 maps with marginal notes ($6.00)

EGS 1989-22 Geology of the Hawk Hill - Griffin - Mountain Lakes area, District of Keewatin; part of NTS 65 G; scale 1:50 000; Canada - NWT Mineral Development Agreement; by L.B. Aspler; 1 map ($4.00)

EGS 1989-23 Pegmatite Studies in the Alymer Lake area, Northwest Territories - Preliminary Report, 1989 Field Season; parts of NTS 75 M, 76 C, D; Canada - NWT Mineral Development Agreement; by P. Cerny, and P. Tomascak; 1 text, 14 p. ($0.60)

EGS 1989-24 Geology of the Southern Kathawachaga area (76 L); scale 1:30 000; by V.A. Jackson; 6 maps ($24.00)

EGS 1989-25 Preliminary Geology of the Central Hope Bay Metavolcanic Belt; parts of NTS 76 O/15, 16; scale 1:50 000; Canada - NWT Mineral Development Agreement; by J. Gebert; 1 map. (unedited)($3.00)

EGS 1989-26 Preliminary Geology of the Torp Lake Metasedimentary Belt; parts of NTS 76 N/5, 6, 3; scale 1:31 000; Canada - NWT Mineral Development Agreement; by R. Johnstone; 1 map. (unedited)($6.00)

EGS 1990-1 Gold Deposit Zoning in the Archean Slave Structural Province; parts of NTS 75, 76, 85, 86; scale 1:1 000 000; updated by W.A. Padgham; 1 map and overlay. Supersedes EGS 1986-3. ($3.50 base map; $1.50 paper overlay; $10.00 mylar overlay)

EGS 1990-2 Geology of the Beniah Lake area; NTS 85 P/8; scale 1:30 000; Canada - NWT Mineral Development Agreement; by D. Roach; 1 map. Supersedes EGS 1989-9. (unedited)($3.00)

EGS 1990-3 Surficial Geology of the Yellowknife River Basin; parts of NTS 85 I, J, O, P & 86 A; scale 1:250,000; by D. Kerr; 1 map ($3.00)

CHAPTER 2
OPERATING MINES

Carol Ellis, Staff Geologist
Kate Hearn, Research Geologist

INTRODUCTION

At the beginning of 1986, eight mines were operating in the NWT: four gold mines, three lead-zinc mines and one tungsten mine. By the end of 1987, the number of operating mines was reduced to six: five gold mines and two lead-zinc mines (Fig. 2-1). Tom Mine was brought into production in September 1986. Cantung Mine closed in mid-1986 and Salmita Mine closed in early 1987. Pine Point Mine ceased mining at the end of June 1987, but continued to mill stockpiled ore into 1988. Production statistics for the 1986 and 1987 are summarized in Table 2-1.

The reports on RED 24 and Bullmoose projects were written by Kate Hearn. The rest of this chapter was written by Carol Ellis.

MINERAL PRODUCTION

The NWT ranked sixth in Canada for mineral production in 1986, ahead of Newfoundland, Manitoba, New Brunswick Nova Scotia and Yukon, by contributing 2.4% of Canada's total mineral production, including metals, oil and gas and industrial minerals. In 1987 the NWT ranked seventh in Canada for mineral production but its contribution to Canada's total mineral production increased to 2.6%. The NWT contributed 12% of Canada's gold production in 1986 (Table 2-2) and 10% in 1987. Silver production was 2.5% of Canada's total in 1986 and 1.8% in 1987. Lead and zinc production were both roughly 40% of Canada's production for both years. Cantung Mine was Canada's only tungsten producer in 1986.

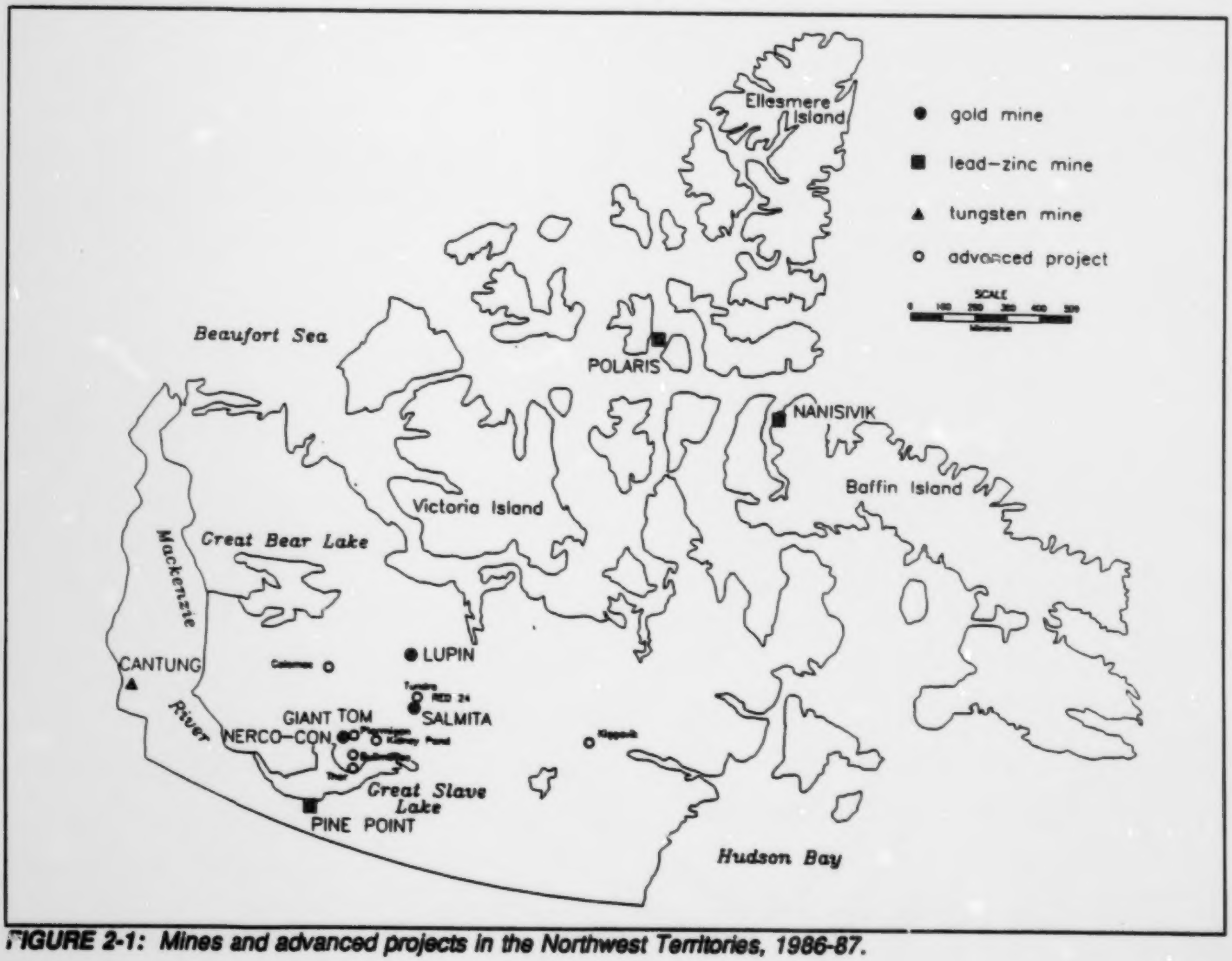

Ellesmere Island
● gold mine
■ lead–zinc mine
▲ tungsten mine
○ advanced project
SCALE
Beaufort Sea
POLARIS
NANISIVIK
Baffin Island
Victoria Island
Great Bear Lake
Mackenzie River
LUPIN
CANTUNG
Tundra
RED 24
GIANT TOM
SALMITA
NERCO–CON
Great Slave Lake
PINE POINT
Hudson Bay

FIGURE 2-1: Mines and advanced projects in the Northwest Territories, 1986-87.

Table 2-1: *Production Statistics for mines operating in the Northwest Territories during 1986 and 1987.*

Mine	**Commodities**	**Ore Milled**	**Production**	**Reserves** (proven and probable)	**Grade**
NERCO Con	gold, silver	197 584 t	2777 kg Au 519 kg Ag	1 296 995 t	14.1 g/t Au
		192 000 t	*2576 kg Au* *515 kg Ag*	*2 437 711 t*	*11.3 g/t Au*
Giant	gold, silver	292 165 t	1993 kg Au 768 kg Ag	938 930 t	8.8 g/t Au
		338 725 t	*2380 kg Au* *606 kg Ag*	*953 446 t*	*8.44 g/t Au*
Tom	gold, silver	10 800 t	61 kg Au	13 600 t	13.03 g/t Au
		8 285 t	*85 kg Au*	*not reported*	
Salmita	gold, silver	63 380 t	1529 kg Au 247 kg Ag	10 885 t	25.7 g/t Au
		21 155 t	*545 kg Au* *114 kg Ag*	--	--
Lupin	gold, silver	587 530 t	6009 kg Au 995 kg Ag	2 771 250 t	11.8 g/t Au
		613 380 t	*6006 kg Au* *882 kg Ag*	*3 396 480 t*	*11.4 g/t Au*
Pine Point	zinc, lead	2 967 000 t	238 900 t Zn 109 950 t Pb	3 357 000 t	9.6% Zn 3.5% Pb
		3 188 000 t	*287 700 t Zn* *114 220 t Pb*	*680 000 t*	*10.4% Zn* *3.4% Pb*
Polaris	zinc, lead	886 000 t	114 360 t Zn 25 100 t Pb	18 145 000 t	14.5% Zn 3.9% Pb
		984 000 t	*128 800 t Zn* *26 545 t Pb*	*15 060 000 t*	*14.4% Zn* *3.9% Pb*
Nanisivik	zinc, lead, silver	685 800 t	58 400 t Zn 3500 t Pb 24 800 kg Ag	2 818 400 t	9.9% Zn 0.3% Pb 40 g/t Ag
		679 100 t	*57 900 t Zn* *2 500 t Pb* *23 000 kg Ag*	*2 571 700 t*	*10.1% Zn* *0.3% Pb* *45 g/t Ag*
Cantung	tungsten	136 980 t	197 000 STU WO_3	1 270 000 t	1.2% WO3
		--	--	*1 270 000 t*	*1.2% WO3*

Figures for 1986 are in normal print; *figures for 1987 are in italics.*
sources: Company annual reports, Mines Inspection Office, GNWT

Table 2-2: Value of mineral production for the Northwest Territories and Canada, 1986 and 1987.

	Northwest Territories				Canada			
commodity	1986		1987		1986		1987	
	production	value ($million)	production	value	production	value ($million)	production	value ($million)
gold	12 308 kg	202.1	11 507 kg	219.0	102 889 kg	1689.3	115 818 kg	2204.5
silver	27 329 kg	6.9	25 117 kg	7.5	1 088 t	275.0	1 375 t	424.1
zinc	411 660 t	500.2	474 400 t	604.4	988 000 t	1200.6	1 158 000 t	1475.2
lead	138 550 t	94.4	143 265 t	151.4	334 000 t	227.7	373 000 t	394.8
tungsten	1 420 t	9.9	–	–				
total		$813.4		$982.4		$33 854.4[1]		$36 342.3[1]

[1] total value for all minerals produced in Canada

sources: Company annual reports and Canada Minerals Yearbooks, EMR.

The value of mineral production for the NWT for 1986 exceeded $810 million, a slight increase over 1985. In 1987 the value increased to over $980 million, due to increases in metal prices and accelerated production at Pine Point Mine.

ADVANCED PROJECTS

In 1986, Hecla Mining Corporation, under an agreement with Highwood Resources, commissioned a marketing study of future demand for, and markets for beryllium and related by-products from the Thor Lake deposits (see Chapter 6). Urangesellschaft undertook a pre-feasibility geotechnical study of the Kiggavik deposit and continued to drill the Main and Centre zones to further delineate the deposit.(see Chapter 5).

Neptune Resources acquired a 60% interest in the Colomac property in late 1986 (see chapter 8). In 1987 Neptune drilled 138 holes, totalling 10 811 m, to better define reserves for economic zones of the Colomac sill. Neptune Resources planned to recovery the gold using a vat-leach process, and undertook a pilot project to test the technology under sub-arctic conditions. For 35 days, during October and November 1987, 1360 t of ore grading 3.09 g/t Au was treated in the test vat; 80% recovery was attained and a 3.36 kg dore bar was produced using the vat-leach process (Northern Miner, Dec. 14, 1987).

At Terra Mines Ltd. Bullmoose project, east of Yellowknife, underground development continued. In early 1987, Terra Mines decided not proceed with production and preparations were made to abandon the site.

Refractory ore from an open pit on the Red 24 claim, just north of Salmita Mine, was treated using a bio-leach process developed by Giant Bay Resources. The recovery rate increased to 95.6% when the bio-leach circuit was added to the conventional cyanide circuit, compared to 75-78% recovery using only the cyanide circuit.

In September 1987, Getty Resources and Noranda Exploration, joint venture partners in the Tundra project north of Salmita Mine, announced plans to sink an exploration shaft to recover a bulk sample for metallurgical testing and to continue to explore the deposit from underground. Reserves for the Tundra deposit are estimated to be 24 Mt at a grade of 6.2 g/t Au (see chapter 8).

In September 1986, Treminco Resources optioned the Ptarmigan Mine from Cominco; Treminco fulfilled the option to purchase agreement in late 1987. Treminco plans to bring the Ptarmigan Mine into production during the second quarter of 1988.

In 1986, Giant Bay Resources began underground development on the Kidney Pond zone at Gordon Lake. Underground development, diamond drilling and bulk sampling continued in 1987 (see Chapter 8).

NERCO-CON MINE

NERCO-Con Mine Ltd.	Gold, Silver
P.O. Box 2000	85 J/8
Yellowknife, NWT	Con Shaft:
X1A 2M1	62°26'22"N, 114°22'08"W

REFERENCES

Boyle (1961); Brophy (1984); Bullis, *et al.*, 1987; Campbell (1947); Helmstaedt and Padgham (1986); Henderson (1985); Henderson and Brown (1966); Padgham (1987).

PROPERTY

CON 1-4, GG 1-14, MEG 1-10, MIDNIGHT 1, NEGUS 1-4, PIZ 1-2, P&G 1-4, ROSE, SOL 1-4, STAR 1-2.

LOCATION

NERCO Con Mine is on the south side of the City of Yellowknife (Fig. 2-2).

HISTORY

Con, Rycon and Negus mines developed separately during the late 1930's; Cominco consolidated the properties in the early 1950's. The Con group of claims were staked in September and October 1935 for Consolidated Mining and Smelting. A shaft was started in the summer of 1937. On September 5, 1938 Con Mine

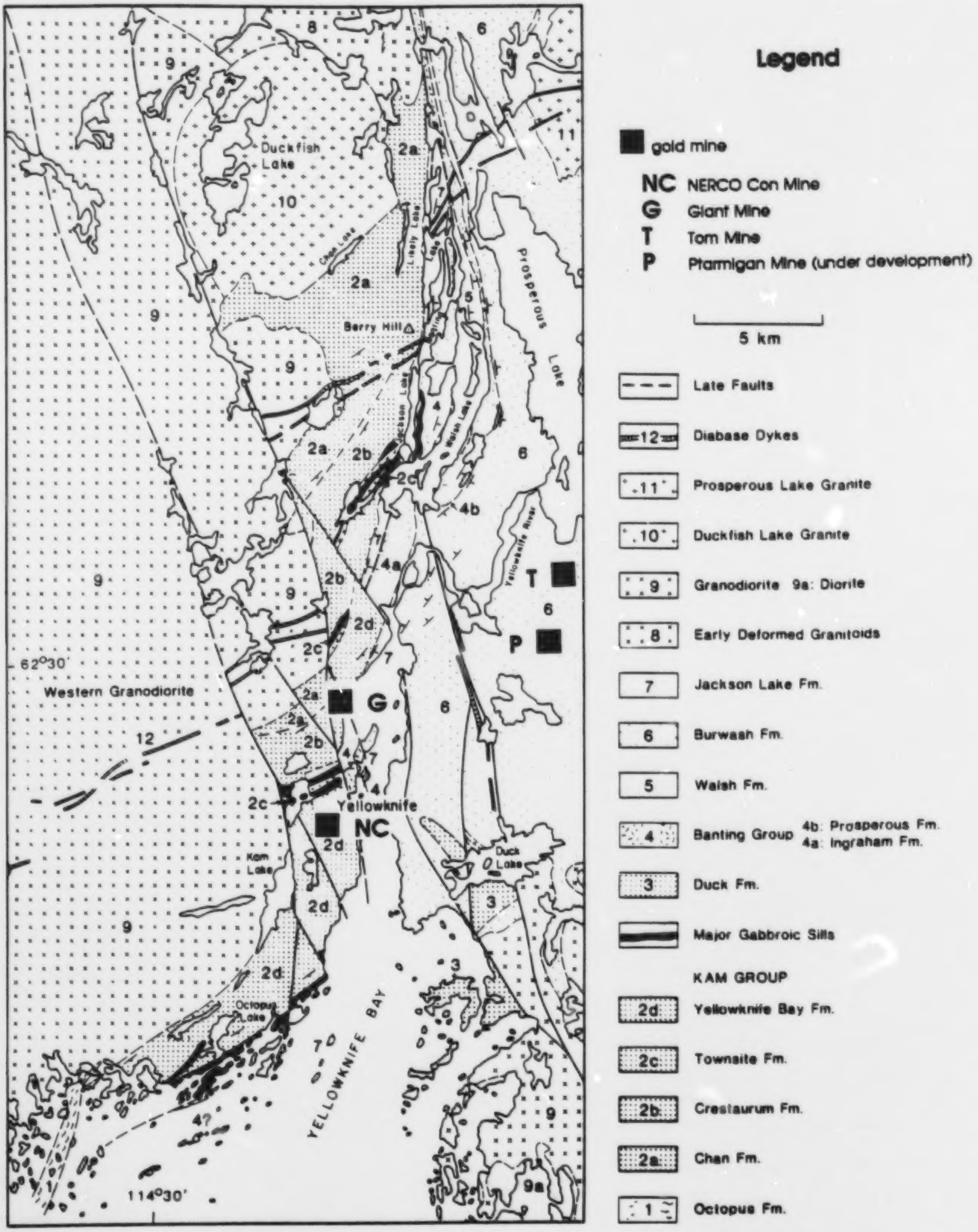

Legend
gold mine
NC NERCO Con Mine
G Giant Mine
T Tom Mine
P Ptarmigan Mine (under development)
5 km
Late Faults
12 Diabase Dykes
11 Prosperous Lake Granite
10 Duckfish Lake Granite
9 Granodiorite 9a: Diorite
8 Early Deformed Granitoids
7 Jackson Lake Fm.
6 Burwash Fm.
5 Walsh Fm.
4 Banting Group 4b: Prosperous Fm. 4a: Ingraham Fm.
3 Duck Fm.
Major Gabbroic Sills
KAM GROUP
2d Yellowknife Bay Fm.
2c Townsite Fm.
2b Crestaurum Fm.
2a Chan Fm.
1 Octopus Fm.
Duckfish Lake
Chan Lake
Likely Lake
Berry Hill
Jackson Lake
Walsh Lake
Prosperous Lake
Yellowknife River
Western Granodiorite
62°30′
114°30′
Yellowknife
Kam Lake
Duck Lake
Octopus Lake
YELLOWKNIFE BAY
NC
G
T
P
8
6
9
10
11
2a
2b
2c
2d
3
4
4?
4a
4b
5
7
9a
12

***FIGURE 2-2:** Geology of the Yellowknife area, showing NERCO Con, Giant, Tom and Ptarmigan mines (from Helmstaedt and Padgham, 1986).*

poured the first gold brick in the NWT. The P&G claims were staked by G. Latham and T. Payne. Consolidated Mining and Smelting obtained controlling interest in the property in 1937 and formed Rycon Gold Mines Ltd to explore and develop the property. Ore from Rycon Mine was treated at the Con mill.

The NEGUS group was staked in 1936 by O. Hagen and others. Negus Mine became the second gold producer in the NWT when it poured its first gold brick in February 1939. Negus Mine closed in 1952 because of depleted reserves. Cominco acquired the mineral rights to the Negus claims in 1953.

Production was suspended from 1943 to 1946 because of labourer shortage during WW II. During this time Neil Campbell, using faults and dykes, determined that continuation of the Giant shear zone, offset by the West Bay Fault, continued under the CON-RYCON-NEGUS properties. The Campbell shear zone has been the source of most ore at CON since 1958. In 1970, the mill was converted to treat free-milling gold found at deeper levels of the Campbell shear zone. The Robertson shaft, completed in 1977, made the lower workings of the Campbell shear zones accessible.

By the end of 1985, 134 585 kg Au had been produced 6 658 964 t of ore from the Con, Rycon-Negus and Campbell shear zones (Bullis *et al.*, 1987).

DESCRIPTION

The northerly trending Yellowknife volcanic belt is a sequence of north-northeasterly striking, steeply dipping Kam Group mafic flows and tuffs, intruded by numerous dykes and sills. The volcanic belt is overlain to the east by a turbidite basin, and intrude from the west by the Western Granodiorite. Metamorphic grade ranges from greenschist in the upper part of the Kam Group to amphibolite grade near the contact with the Western Granodiorite. The Yellowknife volcanic belt has been described by Boyle (1961), Henderson and Brown (1966) and Helmstaedt and Padgham (1986) and Padgham (1987).

Helmstaedt and Padgham (1986) proposed raising the Kam Formation to group status, and establishing four formations: Chan, Crestaurum, Townsite and Yellowknife Bay formations (Fig. 2-2).

The Campbell shear zone, from which the bulk of production for the Con Mine has come, cuts the Yellowknife Bay Formation, the upper most formation of the Kam Group. Volcanic flows strike 050° and dip steeply to the southeast; the Campbell Shear zone strikes 030° and dips 40° to the west. The shear zones vary in width and contain numerous flexures, splays and blocks of unsheared to weakly sheared volcanics. The Campbell shear zone is 60 m to 300 m wide, has been traced for about 8 km and is truncated to the north by the West Bay fault. Orebodies are tabular and range in size from 1.5 m to 18 m thick, 15 to 180 m along strike and up to 180 m along dip.

Gold is in intensely folded, brecciated and boudinaged quartz-ankerite veins, hosted a sericite-chlorite-carbonate schist. Other minerals in the orebodies include pyrite, pyrrhotite, arsenopyrite, sphalerite, galena, chalcopyrite, scheelite, tourmaline and sulphosalts. Sulphide content does not exceed 5%, and is usually less than 2%. Above the 3100 level ore is refractory, gold is associated with arsenopyrite. Below 3100 level, now the main area of production, gold is free milling; above this level ore is refractory.

CURRENT WORK AND RESULTS

Cominco, in an effort to reduce its debt load, sold Con Mine to NERCO Minerals Company in December 1986 for $64 million. Because of the impending sale of the mine, exploration during 1986 was restricted to areas being developed for production.

In 1987, US$13.7 million were spent on capital improvements at Nerco Con Mine. Production was from the 3900-ft level to the 5100-ft level. In addition to exploration and development on the producing levels, the north end of 4900-ft level and 5300-ft level and the south end of the 5700-ft level were being explored and developed (pers. comm. with mine staff). Fifteen holes totalling 2400 m were drilled on surface between the Rycon and Negus shafts.

NERCO Con Mine began to re-examine older workings in the Campbell shear zone between the 2300-ft and 3100-ft levels to assess to the possibility of removing crown and stope pillars with remote control scoop trams and to re-evaluate lower grade zones.

Gold production was 2777 kg in 1986 and 2576 kg in 1987 (Tab. 2-1). Since 1938, 139 940 kg of gold has been recovered from 7 048 550 t of ore.

GIANT MINE

Giant Yellowknife Mines Ltd.
Bag Service 3000
Yellowknife, NWT
X1A 2M2

Gold
85 J/8,9
'C' Shaft:
62°29'57"N,
114°21'40"W

REFERENCES

Campbell (1947); Helmstaedt and Padgham (1986); Henderson (1985); Henderson and Brown (1966); Lewis (1987); Padgham (1987).

PROPERTY

AES 27-50; 1 FB claim; GIANT 1-21; GIANT X1-X5; LAW 2-3; 6 LOLOR claims.

LOCATION

Giant Mine is 5 km north of Yellowknife (Fig. 2-2).

HISTORY

The GIANT claims were staked in 1935 by C.J. Baker and H.M. Muir for Burwash Yellowknife Mines Ltd. Giant Yellowknife Mines was incorporated in 1937 and acquired the ground. First production was from the Brock veins in 1939 and 1940: roughly 110 t containing 28 kg of gold and 9 kg of silver was hand sorted and sent to Trail B.C. for treatment.

In 1944 diamond drilling, to test the idea that Baker Creek valley was underlain by a large shear system, delineated the largest tonnage gold deposit in the NWT at that time. Development of the mine infrastructure began in 1945. Giant poured its first gold brick in May 1948.

Giant acquired an interest in the Lolor group in 1948 and did some development work in the fifties and mid-sixties. The Supercrest group, staked in 1936, is owned jointly by Akaitcho Yellowknife Mines Ltd. and Giant Yellowknife Mines Ltd. Production from both Lolor and Supercrest commenced in 1967 from extensions from Giant Mine's underground workings.

Production from open pits began in 1974 and have contributed roughly 40% of Giant production in recent years.

In November 1985, Giant poured its 10 000th gold brick.

DESCRIPTION

The Giant deposit is a system of gold-bearing quartz-carbonate-sericite shear zones cutting Kam Group volcanics of the Yellowknife volcanic belt.

The Yellowknife volcanic belt, a northerly trending Archean greenstone belt, has been described by Boyle (1961), Henderson and Brown (1966) and Helmstaedt and Padgham (1986). The regional geology is shown in Figure 2-2.

Kam Group massive and pillowed flows trend northeasterly and dip steeply to the southeast. The Giant shear system strikes roughly 030° and dips predominantly to the west, crosscutting the Kam Group volcanics at a low angle. Shear zones have been traced for 6.5 km and extend to a depth of more than 600 m.

Orebodies comprise irregular lenses of quartz-carbonate veins enveloped by sericite-chlorite-carbonate schist. Other minerals include pyrite, arsenopyrite, sphalerite, chalcopyrite, stibnite, sulphosalts and pyrrhotite. Ore is refractory; gold is associated with arsenopyrite and pyrite. Orebodies tend to follow the plane of the shear zone and are developed at flexures in the shear zone and intersections of shear zones (Lewis, 1987).

Most of the orebodies at Giant are in a wedge of volcanics bounded to the south by the West Bay fault and to the north by the Akaitcho fault. The GKP zone is north of the Akaitcho fault.

CURRENT WORK AND RESULTS

The C-Crown pit, the only open pit mined in 1986, contributed 31.2% of the mill feed that year. In 1987, mining of the C-1 pit was completed and mining commenced in B-3 and A-2 pits. The open pits contributed 35.8% of the mill feed.

Mining of the U.B.C. zone was completed in 1986, but ore continued to be removed during 1987.

By the end of 1986 the 2nd level of the GKP zone, on the Supercrest property, had been developed; the 3rd level was developed by the end of 1987. Production was from the 1st level in 1986 and the second level in 1987. The GKP orebody is more irregular and discontinuous than was indicated by diamond drilling. Reserves below the third level have been removed from the proven or probable categories until further drilling is done.

Lateral development increase to 5540 m in 1986 from 4485 m in 1985. In 1987, a ramp was driven from surface to the 1250 level. Lateral development, including ramp development, increased to 8290 m in 1987. Definition drilling increased by roughly 25% in 1986 to 9907 m, but decreased in 1987 to 8230 m in 1987.

A crusher was installed on surface in 1986 to process ore from the open pits and satellite zones, by-passing the underground crushing system.

Gold recovery increased to 87.3% in 1986, due in part to the installation of a carbon stripping circuit, which recovers gold form the activated carbon used to extract gold from the roaster gases. Gold recovery was 86.6% in 1987.

In 1987, a 100 t/d pilot plant was built to determine the feasibility of recovering gold from the tailings. The plant operated from June to August and a recovery rate of 38% was attained. The decision was made to proceed with the project, and by the end of 1987, $4.4 million had been spent on site preparation and $3.3 million on a new tailings dam.

Gold production was 1992 kg in 1986 and 2380 kg in 1987 (Tables 2-1 and 2-2). Since 1948, approximately 183 850 kg of gold has been recovered from 11 931 000 t of ore.

In August 1986, Pamour Inc. acquired Falconbridge Ltd.'s 19.16% share in Giant Yellowknife Mines Ltd. Giant Yellowknife acquired Pamour's mines in the Timmins area of Ontario in January 1987, increasing Pamour's interest in the company to 50.2%. Pamour's parent company, Giant Resources of Australia, acquired a 16.7% direct interest in the company in September in September 1987, reducing Pamour's interest to 41.8%

TOM MINE

Treminco Resources Ltd.	Gold
1110 - 625 Howe St.	85 J/9
Vancouver, B.C.	62°32'N
V6C 2T6	114°11'W

REFERENCES

Brophy (1987), Henderson (1975), Padgham and Brophy (1986)

DIAND Assessment Report: 062212

PROPERTY

TOM claim

LOCATION

Tom Mine is 21 km northeast of Yellowknife by road (Fig. 2-2).

HISTORY

The TOM claims were staked in 1936 by T. Cassidy, who optioned the property to Consolidated Mining and Smelt Company (now Cominco) in 1939. Between 1939 and 1945, Cominco did geological mapping, trenching and diamond drilling of 24 holes totalling 1990 m.

The company sank a 17 m shaft on the Tom vein. Underground drilling delineated 6 530 t with a grade of 14.4 g/t Au. Drilling done by Cominco totalled 1990 m in 24 holes.

In 1945, Cassidy Yellowknife Mines Limited acquired the property. During 1945 and 1946 the company drilled 10 125 m in 88 holes. Little work was done until Apex Energy Corporation purchased the TOM claims in 1984.

In 1985, Treminco Resources Ltd., in joint venture with Goldrich Resources Inc., acquired the property.

The area is underlain by complexly folded turbidites of the Burwash Formation (Fig. 2-2). Part of the Yellowknife supracrustal basin, the Burwash Formation overlies Kam Group volcanics to the west and is intruded by the Prosperous Lake Granite to the northeast of Tom Mine. The Tom deposit, a gold-bearing quartz vein, is hosted in amphibolite-grade turbidites within the contact metamorphic aureole of the Prosperous Lake Granite. Most of the gold-bearing quartz veins in the turbidite basin are hosted in greenschist-grade turbidites (Padgham and Brophy, 1985).

Four quartz veins have been drilled, however the only the Tom vein, also known as the No. 3 vein, has been mined.

The Tom vein trends roughly 100°, dips steeply and cuts bedding at a high angle. It is discontinuous, has been traced for 365 m and is up to 8 m wide. The Tom vein is truncated to the east by the Ptarmigan Fault.

Gold is free-milling, but erratically distributed in the quartz veins. The quartz vein contains less than 1% other minerals. The most abundant sulphide minerals are pyrite, sphalerite and galena; other minerals include arsenopyrite, chalcopyrite, pyrrhotite, native copper, tourmaline, feldspar, carbonate and scheelite. Sulphide-rich parts of the vein are not indicative of economic grade, but usually do contain gold (Brophy, 1987).

CURRENT WORK AND RESULTS

In September 1985, Treminco began to develop Tom Mine for production. A 170 m long decline was driven to a depth of 45 m to access the main ore block of the Tom vein. A 2720 t sample of ore was taken for metallurgical testing. The ore was custom-milled at nearby Giant Mine; recovery rate averaged 85%. Treminco plans to acquire a mill for its Tom and Ptarmigan mines. It expects that recovery will increase to 96%.

Tom Mine was brought into production in September 1986 using the shrinkage stoping mining method. Between February 1986 and July 1987, over 19 000 t of ore was treated at the Giant Yellowknife mill, producing roughly 140 kg of gold.

Tom Mine was developed by Treminco Resources to gain investor confidence to support Treminco's acquisition of the nearby Ptarmigan Mine. In 1987 Treminco negotiated an agreement to purchase the nearby Ptarmigan Mine from Cominco Ltd.

BULLMOOSE PROJECT

Terra Mines Ltd.	Gold
#202, 7608 - 103rd St.	85 I/7
Edmonton, Alta.	62°20'30"N,
T6E 4Z8	112°44'30"W

REFERENCES

Caine and Brown (1987), EMR (1989), Gibbins *et al.* (1977), Swatton (1985).

PROPERTY

TA 1-8, TER 1,2

LOCATION

The property is 80 km east of Yellowknife and 6 km west of Francois Lake.

HISTORY

The original TA group of 20 claims were staked in 1939 for the Consolidated Mining and Smelting Company. In 1940 and 1941, work consisted of trenching and drilling seventeen holes. An 18 m inclined shaft was sunk and 15 m of drifting and limited drilling tested the "No. 4" vein. A high grade-surface exposure of the "No. 1" vein was mined (Western Miner, June 1984) which produced 6.53 kg of gold from 10.9 t of material (Caine and Brown, 1987)

By 1961, twelve TA claims had lapsed and the eight remaining claims were transferred to W.L. McDonald. Visible gold was discovered; this showing was trenched and drilled in the following year (Western Miner, June 1984).

The property was acquired by Duke Mining Ltd. in 1967. Between 1967 and 1972, 3 632 m were drilled in 70 holes, showings were trenched and sampled and the stockpile from the old shaft was sampled (NMI 85 I/7 Au 1).

Terra Mining and Exploration entered a joint venture with Duke Mining in 1972 and by 1976 had earned 50% interest in the property by completing $200 000 of development work (Gibbins *et al.*, 1977). Work included nine diamond-drill holes totalling 390 m and 813 m of underground development. A 400 m northwesterly directed decline with a 15% grade was driven to -67 m to open up on the No. 4 vein. Drifting and cross cutting explored the -15 m and -20 m level and 2 400 t at an estimated grade of 13.7 g/t Au was stockpiled (NMI 85 I/7 Au 1). Drilling of the No. 4 vein indicated 34 g/t over a 1.8 m width and 90 m length (NMI 86 I/7 Au 1).

With the fall of gold prices in 1976, work was discontinued until 1981 when Terra Mines tested the No. 4 vein to a depth of 304 meters by drilling 1500 m from surface in 19 holes. Drill indicated reserves to 64 m depth were 25 000 t at 11.6 g/t Au (NMI 86 I/7 Au 1). In November, Terra Mines acquired the remaining 50% interest in the property through a successful takeover bid of Duke Mines Ltd.

In 1983, 3 336 m of surface drilling and 2934.7 m of underground drilling delineated 11 more auriferous veins, bringing the number of veins to 15. The decline was advanced 390 m and 500 m of drifting was completed, 75% of which was on veins on the -90 m level. The work indicated reserves to the -300 m level of 630 000 t grading 10.6 g/t (Terra Mines 1983 Annual Report).

DESCRIPTION

The claims are underlain by interlayered greywacke and argillites of the Burwash Formation. Rocks have been metamorphosed to nodular greywackes, phyllites and mica schists. On a property wide scale, Swatton (1985) identified domains of well bedded Bouma sequences, psammites and pelites forming an F_1 syncline with a possible hinge zone of an F_2 fold on the western limb. Swatton (1985) notes that higher grade quartz veins are on the southern limb of the F_2 anticline. Quartz veins are parallel to enclosing strata and contain pyrite, arsenopyrite, scheelite, chalcopyrite, sphalerite, galena and silver. Gold forms fine blebs and fills fractures within the quartz veins and adjacent wall rock (NMI 85 I/7, Au1).

CURRENT WORK AND RESULTS

In 1984, 20% of the 5 400 ha property was prospected and mapped. The decline was enlarged to 3.4 m by 4.6 m to accommodate 15 t underground trucks (Terra 1984 Annual Report). By 1984, 27 veins had been discovered.

Surface geophysical surveys in 1985 detected coincident EM and magnetic anomalies along two major structures, thought to be faults or shear zones, adjacent to gold bearing veins (NMI 85 I/7 Au 1, Northern Miner, August 1, 1985). By the end 1985, geologic reserves had been calculated at 240 100 t grading 11.1 g/t Au (Terra 1985 Annual Report). At that time the company had stockpiled 45 500 t of ore at 4.5 g/t Au and 6 400 t at 13.7 g/t Au. Facilities in camp continued to be upgraded and by the end of the year included a 1524 m airstrip.

A modular 68 tpd test mill, constructed during 1985 and trucked to site along the winter road, began processing ore in April 1986 (Terra 1986 Annual Report). Up to 60% of the gold was recovered with jigs and the remaining flotation concentrate was shipped to Cominco's smelter in Trail B.C. for refining. No cyanide circuit was installed because of environmental concerns (Brophy, 1986 Exploration Overview).

At the end of April, total reserves from all categories were reported to be 255 000 t grading 10.6 g/t Au, based on a 1.2 m mining width and a 6.9 g/t cut-off grade (after NMI 85 I/7 Au1). By July, 47 kg of gold was produced from 3.6 kt of ore with an average head grade of 14.4 g/t Au (Brophy, 1986 Exploration Overview). One development heading was reported to average 12.7 g/t Au across 4.3 m over a distance of 19.8 m (Northern Miner 07/28/86). Mill test on ore from all areas of the mine indicated that the mill head grade was 72% of exploration grade (Terra 1986 annual report). The company decided not to proceed with production, citing risks associated with narrow vein deposits in remote locations and lack of significant tonnage per vertical foot.

Table 2-3: Underground development at Bullmoose Mine, 1984 to 1986

YEAR	DRILLING (m) *surface* underground	DECLINE ADVANCE (LEVEL m)	DRIFTS, SUBDRIFTS, CROSSCUTS	RAISING (m)
1984	*9 432.6* *5 852.7*	-163.4	2 083.0	882.0
1985	*1 524.4* *3 254.0*	-183.0	912.8	490.0 (Includes 78.6 m on Alimak raise)
1986	*2 918.3* *6 862.8*	-213.4 New decline advanced to -30.5	2 952.7	

Bulk sampling was completed in March 1987 and milling was completed by the end of June. Equipment, buildings and inventory were prepared for removal by ice road in 1988 (Terra Mines Ltd. 1987 Annual Report). Production between the years 1985-87 was 665 kg of gold from 49 400 t of material mined from 15 veins (EMR, 1989).

SALMITA MINE

Giant Yellowknife
Mines Ltd.
Bag Service 3000
Yellowknife, NWT, X1A 2M2

Gold, Silver
76 D/3
64°04'30"N,
111°14'26"W

REFERENCES

Dillon-Leitch (1981, 1984); Henderson (1944); Moore (1956); Ransom (1983); Ransom and Robb (1985)

PROPERTY

GIANT 1, JEJA 1-6, LT 1-3, LUFF 1-4, MAD 1-18, RED 24, REP 1-12, SALERNO 1-18, TOUGH 1-6, WIN 1-18.

LOCATION

Salmita Mine, on the east shore of Matthews Lake is roughly 240 km northeast of Yellowknife. A 1350 m gravel airstrip 3.7 km from the mine makes it accessible year round by fix-wing aircraft. In winter an ice road connects Salmita Mine to the Lupin ice road.

HISTORY

Frank Salerno staked SALERNO 1-18 in 1945. Salmita Northwest Mines Limited was incorporated that year to develop the property. LT 1-3 was staked in 1946. After Salmita Consolidated Mines Limited acquired the property in 1949, TOUGH 1-6 and LUFF 1-4 were staked.

In 1950, 17 690 t grading 16.46 g/t were outlined in the B vein. The zone is 105 m along strike by 1.4 m wide to a depth of 46 m.

A 44 m shaft was sunk on B vein in 1951. Exploration at the 38 m level included 35 m of crosscutting and drifting. A 90 kg bulk sample tested by the Mines Branch, Ottawa, contained 31.89 g/t Au and 9.77 g/t Ag. The property was optioned to Mack Lake Mining Corporation in 1954.

Bluebell Enterprises acquired the property in 1973 and optioned it to Giant Yellowknife Mines Limited in 1974. A decline was driven in 1975 to permit exploration from underground. Indicated reserves of 122 500 t grading 21.67 g/t Au were delineated to a depth of 183 m.

Giant Yellowknife Mines completed the purchase of Salmita property in 1980. A feasibility study in 1981 was followed by an underground exploration program during the summers of 1981 and 1982. Giant purchased the Tundra mill in 1982. Estimated cost of bringing Salmita to production is $13.9 million.

During 1983 the decline was driven from the 2nd to the 4th level, 205 m below surface. Levels were established at roughly

50 m intervals. Salmita mine was brought into production in July 1983 and the first ore was treated at the rehabilitated Tundra Mill in August 1983. In 1984 the decline was advanced to the 6th level.

DESCRIPTION

The area is underlain by the north-northwest-trending Courageous-Mackay Lake supracrustal belt (Fig. 2-3). Turbidites to the east conformably overlie, and are locally interbedded with the volcanics. Granitic rocks intruded the volcanics from the west. The volcanic belt is 65 km long and ranges from 1 to 5 km thick. Although it predominantly comprises mafic flows, there are two cycles of felsic volcanics in the sequence, one near the base and one at the top. Many of the gold-bearing quartz veins are associated with the upper cycle of felsic volcanics.

B-Vein, the main orebody at Salmita, is a gold-bearing quartz vein developed at the contact between an argillite unit and an overlying mafic volcanic unit. The vein trends north-northwest and dips 80° to 85°E. B-Vein is divided into South, Main and North shoots. The South and Main shoots are hosted in argillite and are separated by the Salmita shear zone. The shear zone does not transect the contact between the argillite and overlying mafic volcanics. The North shoot is the mafic volcanics.

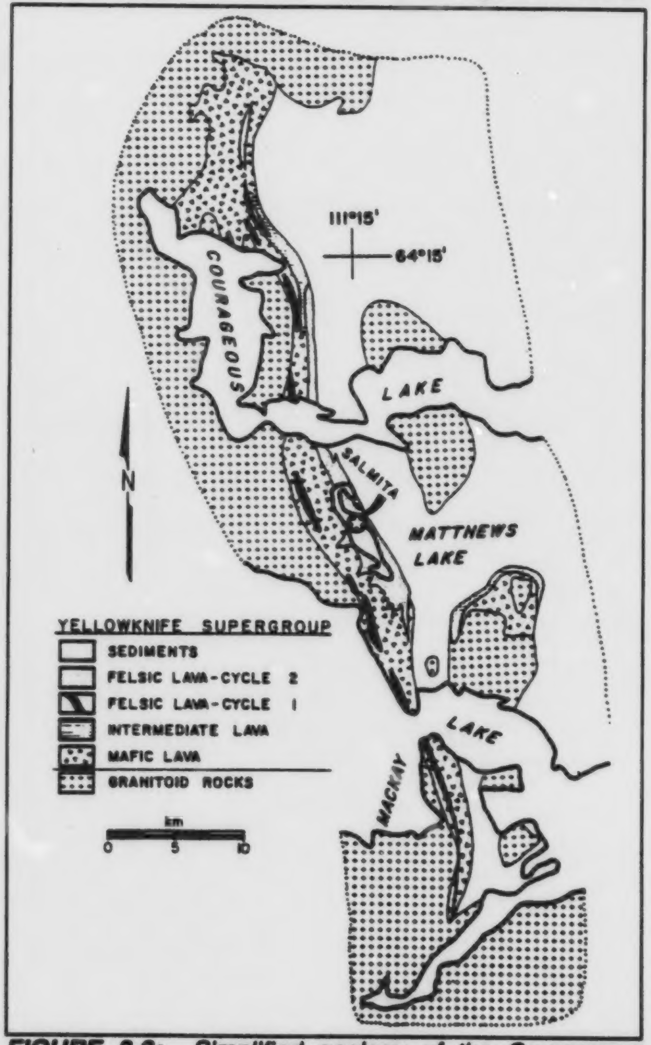


FIGURE 2-3: Simplified geology of the Courageous Lake-MacKay Lake volcanic belt (from Dillon-Leitch, 1981).

The South shoot, light-grey to white quartz with interbanded altered argillite, contains up to 1 to 2% pyrite and equal amounts of arsenopyrite. The South shoot has not been delineated below the 3rd level.

The Main shoot, the main gold-bearing structure of the deposit, is up to 4 m wide. The quartz vein varies in colour from light-grey to dark blue-grey to dark grey at depth. It is enveloped by an alteration zone of quartz, sericite, carbonate and sulphide-rich argillite that is more intense in the foot wall and narrows to the north.

The North shoot quartz vein is enveloped by arsenopyrite-rich, highly carbonatized and silicified mafic volcanics and has a maximum with of 3 m. Between the 2nd level and half way between the 3rd and 4th levels it comprises narrow high-grade zones. Above and below these levels the North shoot is too narrow and sinuous to be economic.

CURRENT WORK AND RESULTS

The ramp to the 7th level was completed in March 1986. An internal shaft from the 6th level to the 10th level, started in October 1985 was completed in May 1986. The lower ore zone between the 8th and 10th levels was developed through to August and was mined out by December 1986. The amount of ore below the 8th level was 50% more than expected based on drill information, but the grade was 36% lower than anticipated.

Gold recovery decreased from 98% in 1985 to 96% in 1986 because refractory ore from RED 24 was treated and included in the total amount of ore treated. Recovery rate for RED 24 ore was 75-78%. During its four years of production, roughly 5437 kg of gold were recovered from 204 144 t of ore for an average grade of 26.6 g/t Au.

Mining ceased in February 1987. By mid March the underground equipment had been removed and the mine was allowed to flood. Although most milling had finished by mid-April, 1905 t of ore recovered from the surface pad during site clean up was milled during July and August. The mill was closed in early September after a bio-leach test on ore from an open pit on RED 24, just north of the mine, was done by Giant Bay Resources.

Drilling on the Salmita, Tundra and RED 24 properties totalled 6736 m from surface and 3519 m from underground.

RED 24

Giant Yellowknife Mines Ltd	Gold
Box 3000	76 D/3
Yellowknife, NWT	64°06'N,
X1A 2M2	111°17'W

REFERENCES

Brophy, 1986; Ellis, 1988.
DIAND Assessment Report 080106; NMI 76 D/3 Au1.

PROPERTY

RED 24 claim

LOCATION

The RED 24 claim is immediately north of Matthews Lake, approximately 240 km northeast of Yellowknife.

HISTORY

The history for the area is summarized in the section on the Tundra Project in chapter 8. The RED 24 claim was staked in 1973 to cover ground previously held as the MC 5 claim, and acquired by Giant Yellowknife Mines. In the same year, the two drill holes totalling 268.3 m intersected sequences of rhyolite fragmental units and andesite. A 30 cm interval of rhyolite fragmental with quartz and pyrite assayed 1.37 g/t Au (assessment report 080106). Drilling on the RED 24 claim in 1983-84 outlined 12 700 t grading 19.5 g/t Au (NMI 76 D/3 Au 1).

DESCRIPTION

The claim is underlain by felsic flows and minor tuffs with thin interbeds of argillite, in contact with sediments at the eastern boundary of the claim and andesites at the western margin of the claim. Auriferous zones on the RED 24 are in the felsic volcanics adjacent to a diabase dyke. Grade decreases away from the dyke (Brophy, DIAND Property visit report, April 24, 1986). Samples taken from the RED 24 pit are described by Brophy (1986) as a layered felsic tuff containing up to 10% acicular arsenopyrite concentrated in layers and minor sulphides including pyrite, galena and sphalerite. Gold is associated with arsenopyrite rich layers.

CURRENT WORK AND RESULTS

Open pit work began on the claim in 1986. Four benches were mined yielding 5680 t grading 18.3 g/t Au (Giant 1986 Annual Report). Giant reported only 75-78% recovery for the refractory ore when treated in a conventional cyanide circuit. At the time it was not economically feasible to extract the remaining reserves of 7 250 t, available only from underground.

In 1987 Giant Yellowknife Mines entered into a joint venture with Giant Bay Resources Ltd. to carry out a test of Giant Bay Resources' Bio-tankleaching process on the RED 24 material. The joint venture agreement granted Giant Yellowknife Mines the exclusive rights to the bio-tankleach technology within a 10 km radius to the RED 24 deposit (NMI 76 D/3 Au 1). The bacteria used was *thiobacillus ferroxidous*, which consumes sulphides to produce less stable sulphates. After leaching, the gold was recovered in the cyanide circuit. A 10 tpd bio-tank leach circuit was added to Salmita's mill and operated during July and August treating 470 t at 25.2 g/t Au (Giant 1987 Annual Report). Recovery rates of up to 95.6% were achieved and a 9.67 kg dore bar was produced (Ellis, 1988).

LUPIN MINE

Echo Bay Mines Ltd.
3300 Manulife Place
10180 101 St.
Edmonton, Alta., T4J 3S4

Gold, Silver
76 E/14
65°46'N, 111°13'30"W

REFERENCES

Bostock (1980); Gibbins (1981); Kerswill *et al.* (1983); King *et al.* (1988, 1989); Strachan and Moffett, 1985; Tremblay (1976).

PROPERTY

CONGO 1-9; 111 MOP claims; PAT 1-3.

LOCATION

Lupin Mine is on the southwest shore of Contwoyto Lake (Fig.2-4), roughly 400 km north-northeast of Yellowknife. It is serviced by a 1525 m gravel airstrip and a winter road. The 531 km winter road, connecting Lupin Mine and Yellowknife, is usually open from February to April.

HISTORY

A Canadian Nickel Company Limited (Canico) reconnaissance crew discovered the main showing in 1960. From 1961 to 1964 exploration included mapping, trenching, geophysical surveys and diamond drilling; 1.2 Mt of ore grading 17.14 g/t Au were outlined.

Canico optioned the property to Echo Bay Mines Limited in 1979, who purchased it in November 1980. Echo Bay drove a spiral ramp to a depth of 130 m and drilled 7000 m in 22 holes to a vertical depth of 200 m; reserves to a depth of 200 m were estimated to be 930 000 t grading 13 g/t Au at a cut off grade of 6.85 g/t Au. Surface facilities were constructed during 1981, 3050 m of drilling was done, and some development ore was stockpiled. By October 1982, a three compartment shaft had reached a depth of 370 m and four levels had been established. The mill, commissioned in April 1982, reached commercial production rate by October, 1982; the first gold brick was poured in May 1982. Underground exploration and development in 1982 increased proven and probable reserves to 3.13 Mt grading 13.58 g/t Au.

In 1983 mill capacity was increased by 20% to over 1100 t/d. In 1984, operating costs lowered as a result of a 50% expansion of the mill capacity, enabling the cut-off grade to be reduced. A three-year shaft-sinking project was started late in 1984.

DESCRIPTION

The Lupin area is underlain by complexly folded turbidites of the Contwoyto Formation which have been metamorphosed to upper greenschist facies (Fig. 2-4). Bostock (1980) distinguished Contwoyto Formation turbidite from Itchen Formation turbidite by the presence of scattered bands and lenses of silicate-, sulphide- and oxide-facies iron formation. Itchen Formation does not contain iron formation.

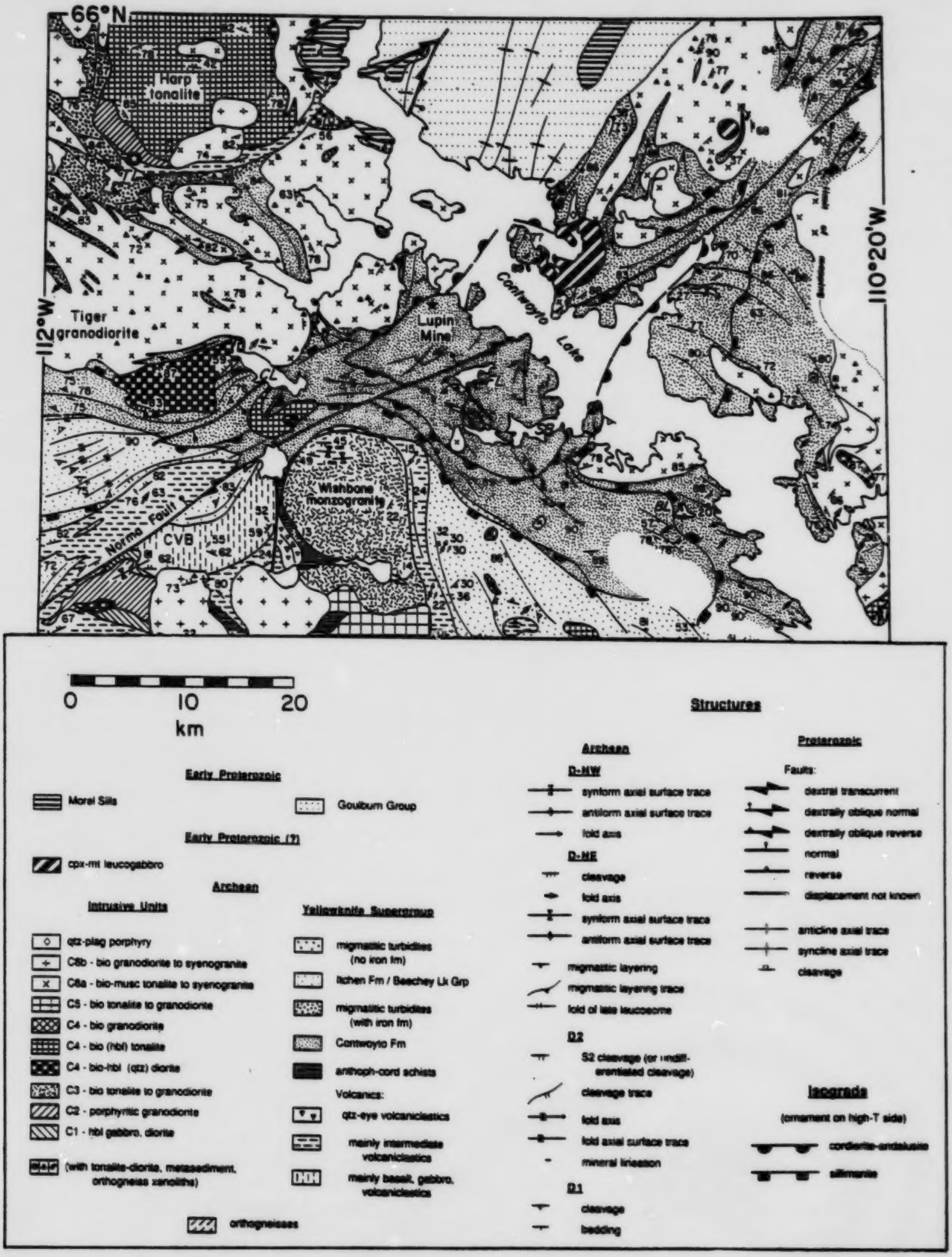

66°N
112°W
110°20'W
Harp tonalite
Tiger granodiorite
Lupin Mine
Contwoyto Lake
Wishbone monzogranite
CVB
Norma Fault
CL
SB
BL
0
10
20
km
Early Proterozoic
Morel Sills
Goulburn Group
Early Proterozoic (?)
cpx-mt leucogabbro
Archean
Intrusive Units
qtz-plag porphyry
C8b - bio granodiorite to syenogranite
C8a - bio-musc tonalite to syenogranite
C5 - bio tonalite to granodiorite
C4 - bio granodiorite
C4 - bio (hbl) tonalite
C4 - bio-hbl (qtz) diorite
C3 - bio tonalite to granodiorite
C2 - porphyritic granodiorite
C1 - hbl gabbro, diorite
(with tonalite-diorite, metasediment, orthogneiss xenoliths)
orthogneisses
Yellowknife Supergroup
migmatitic turbidites (no iron fm)
Itchen Fm / Beechey Lk Grp
migmatitic turbidites (with iron fm)
Contwoyto Fm
anthoph-cord schists
Volcanics:
qtz-eye volcaniclastics
mainly intermediate volcaniclastics
mainly basalt, gabbro, volcaniclastics
Structures
Archean
D-NW
synform axial surface trace
antiform axial surface trace
fold axis
D-NE
cleavage
fold axis
synform axial surface trace
antiform axial surface trace
migmatitic layering
migmatitic layering trace
fold of late leucosome
D2
S2 cleavage (or undifferentiated cleavage)
cleavage trace
fold axis
fold axial surface trace
mineral lineation
D1
cleavage
bedding
Proterozoic
Faults:
dextral transcurrent
dextrally oblique normal
dextrally oblique reverse
normal
reverse
displacement not known
anticline axial trace
syncline axial trace
cleavage
Isograds
(ornament on high-T side)
cordierite-andalusite
sillimanite

FIGURE 2-4: Regional geology of the Lupin Mine area (from King et al., 1989).

The Lupin deposit is a stratabound silicate-and sulphide-facies iron formation interbedded in a greywacke. The foot wall is quartzite, the hanging wall is phyllite. Contacts between the wallrock and the iron formation are usually well defined. The turbidites and interbedded iron formation have been tightly to isoclinally folded into a Z-shaped syncline-anticline pair. Fold hinges connecting these zones plunge roughly 75° to the northeast.

Free gold ranging in size from 5 to 50 µ is associated with fine-grained pyrrhotite, which forms fine laminations in the sulphide-facies of the iron formation. Gold is also found in inclusions along grain boundaries of arsenopyrite and loellingite. There are two distinct units in the iron formation: an auriferous sulphide-rich unit and a sulphide-poor silicate facies unit that contains very little gold. The sulphide unit contains more than 5% sulphides in thin bands, some of which can be traced for 16 m along strike, and comprises pyrrhotite, grunerite, quartz and feldspar and lesser amounts of arsenopyrite, loellingite and almandine. Gold is in the sulphide-rich iron formation. The sulphide-poor unit comprises hornblende, cummingtonite, grunerite and garnets.

A late system of quartz veins cross cut the structure at 65° to the strike of the Centre zone and increase in frequency in the fold nose areas. There are fewer of these quartz veins cutting the East zone. The late quartz veins are barren of gold, but have halos of loellingite and coarse-grained arsenopyrite. These quartz veins do not extend far into the wall rock and the bulk of the sulphides in the wallrock is associated with alteration halos around these late quartz veins.

The iron formation averages about 6 m wide, but has been thickened in places by minor folding. At the north and south noses of the Centre zone the iron formation is so tightly folded that the overall width is up to 25 m wide.

The Lupin deposit is divided into three main ore zones, coinciding with limbs of the folds: East, Centre and West zones. The East zone extends for 220 m along a northeasterly strike and varies in dip from 70°W near the south nose, through vertical to 70°N. Gold content decreases from surface to 330 m level; below 330 m level mineralized areas are not economic.

The Centre zone strikes northerly for 270 m, dips to the east at 70 to 80° and ranges in width from 5 m to 25 m. The Centre zone has maintained consistent tonnage and grade with depth.

The West zone has a strike length of 600 m and varies in width from 1 m to 6 m width. The dip of the zone varies from 80°W at the north nose through vertical to 80°E toward the southern limit of the ore zone.

CURRENT WORK AND RESULTS

During 1986, the shaft was deepened to 780 m. A development drift driven along the Centre Zone to the north fold on the 650 m level and diamond drilling confirmed that the Centre and West zones are similar in dimension and grade to those zones on the upper levels. In 1987, development on the levels between the 330 m and 650 m levels added 12 440 kg of gold to ore reserves. In late 1987 a new hoist capable of operating down to 1220 m was commissioned. Another shaft deepening project will commence in 1988, extending the depth of the shaft to 950 m.

Average daily milled through put continued to increase annually from 1555 t in 1985, to 1616 t in 1986, reaching 1686 t in 1987. Lupin produced 6009 kg of gold in 1986 and 6006 kg in 1987. Proven and probable ore reserves at the end of 1987 were 3.4 Mt with a grade of 11.38 g/t Au.

PINE POINT MINE

Pine Point Mines Ltd.
c/o Cominco Ltd.
2600 - 200 Granville St.
Vancouver, B.C. V6C 2R2

Zinc, Lead
85 B/15,16
60°50'50"N,
114°27'12"W

REFERENCES

Anderson and Macqueen (1982); Campbell (1967); Gibbins (1983); Jackson and Beales (1967); Kyle (1980); Macqueen and Powell (1983); Rhodes (1981); Rhodes *et al.* (1984); Skall (1975), Webb (1986).

PROPERTY

Pine Point property comprises 4 476 leased claims.

LOCATION

Pine Point, on the south shore of Great Slave Lake (Fig. 2-5), is connected by road to Hay River and is serviced by a 1370 m gravel airstrip. Freight and lead-zinc concentrate are transported by rail.

HISTORY

Claims were first staked in Pine Point area when prospectors travelling to the Klondike were directed by natives to sulphide showings on the south shore of Great Slave Lake. Because only minor amounts of precious metals were found, these claims were allowed to lapse.

Interest in the area was renewed during the 1920's. In 1929, Northern Lead Zinc Company, formed by Cominco Ltd. and Ventures Ltd., began to explore the area by drilling and trenching. Pine Point Mines Ltd. was formed in 1951 to acquire and explore the property. Cominco holds a 50% interest in Pine Point Mines Ltd.

Construction of a railway from Roma, Alberta to Pine Point commenced in 1962. The town of Pine Point was built between 1963 and 1965. Production from the open pits began in 1964. The first rail shipment, high grade ore averaging about 50% combined lead and zinc, left Pine Point in early 1965.

Pine Point acquired deposits from Pyramid Mining Co. in 1966, Coronet Mines Ltd. in 1972 and Conwest-Newconex Canadian Exploration in 1974.

Two main exploration tools used at Pine Point were IP surveys and diamond drilling. Since IP surveying was first used on the property in 1964, over 4000 km of IP surveys have been completed. Since 1948, over 600 km of drill core has been recovered from more than 10 000 holes.

The N81 deposit, discovered in 1981, was the third largest deposit found on Pine Point property, containing 2.7 Mt grading 21% combined lead-zinc.

Low lead and zinc prices in the early 1980's forced Pine Point Mines Ltd. to improve its operations by reducing production from

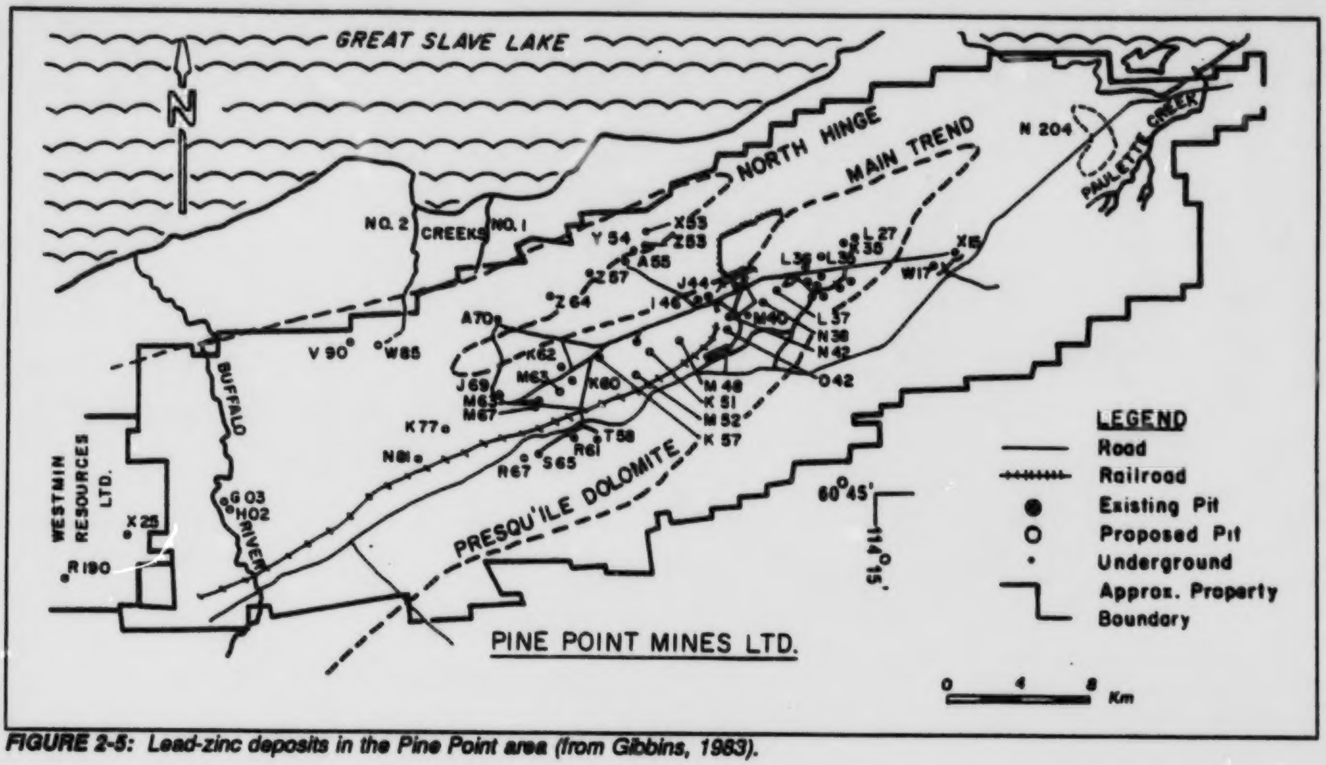

GREAT SLAVE LAKE
N
NORTH HINGE
MAIN TREND
N 204
PAULETTE CREEK
NO. 2
CREEKS
NO. 1
Y 54
X53
Z53
A55
Z57
Z64
L27
K35
L36
L35
X15
W17
J44
I46
M40
L37
N38
N42
O42
A70
V 90
W85
K62
J69
M63
M62
M67
K60
M48
K51
M52
K57
K77
N81
T58
R61
S65
R67
BUFFALO RIVER
G 03
HO2
X 25
R190
WESTMIN RESOURCES LTD.
PRESQU'ILE DOLOMITE
60°45'
114°15'
PINE POINT MINES LTD.
LEGEND
Road
Railroad
Existing Pit
Proposed Pit
Underground
Approx. Property Boundary
0
4
8
Km

***FIGURE 2-5:** Lead-zinc deposits in the Pine Point area (from Gibbins, 1983).*

lower-grade ore sources, reducing the operating time for the concentrator to five days a week and seeking temporary financial assistance from the federal and territorial governments. Higher prices for lead and zinc and improved productivity enabled Pine Point to return a profit in 1984.

Production at Pine Point has been mainly from open pits although underground mining was tested on M-40 deposit in 1973 and a deposit in the western part of the North hinge in 1986.

DESCRIPTION

Within the Pine Point property boundaries (Fig. 2-5) there are 87 deposits, 36 of which have been mined (Rhodes *et al.* 1984). These deposits are at several stratigraphic positions and range in size from 100 kt to 14 Mt. The orebodies are hosted by paleokarst features in a middle Givetian carbonate barrier complex. Lithofacies comprising these formations extend along a strike of 065° for at least 50 km. The Pine Point Formation, the lower two-thirds of the complex, is a very flat lensoidal accumulation of skeletal-derived carbonate muds and sands which have since been dolomitized. It attains a maximum thickness of 175 m at the axis of the barrier and thins to both the north and south.

The Sulphur Point Formation, a tabular biohermal to bioclastic carbonate buildup, conformably overlies the Pine Point Formation along the centre of the barrier, where it reaches its maximum thickness of 65 m. It thins, then ends abruptly on the northern edge of the barrier. It thins to 30 m on the south side of the barrier.

A coarse dolomite alteration, Presqu'ile dolomite, has replaced 60 to 70% of the Sulphur Point Formation on the barrier. The base of the Presqu'ile dolomite is near the contact between the Pine Point Sulphur Point Formation.

Pine Point Formation lies conformably on the Keg River Formation, a marine platform carbonate unit. Keg River Formation is a relatively homogeneous unit of grey-brown dolomite with carbonaceous-argillaceous wisps and partings hosting crinoid ossicles and thin to thick-shelled brachiopods. It is a laterally continuous extensive unit the underlies the Muskeg Formation of the Elk Point Basin and the Pine Point Barrier complex.

Orebodies are classified into two groups. Tabular deposits are flat-lying orebodies associated with a network of karst channels confined mainly to the lower limits of coarse dolomite alteration (Presqu'ile dolomite) at the base of the Sulphur Point Formation. Prismatic deposits are vertically elongate bodies, developed in areas of extreme karstification along the tabular karst system. More intense karstification usually occurs on structurally elevated areas. The average size of prismatic orebodies that have been mined is 1.4 t with a grade of 12% combined Zn-Pb.

Karst networks are developed along two main trends, the North and Main trends, which strike 065°, are coincident with two areas of preferential Presqu'ile dolomite development and are separated by a zone of undolomitized Sulphur Point Formation. Galena sphalerite, marcasite and pyrite are pervasive within the karst networks of the North and Main trends, replacing internal sediments and breccia fragments within the karst, filling open spaces and vuggy to interstitial porosity of the wall rocks, but often are not ore grade.

South Trend, a third mineralized area, is not a distinct trend like the Main and North trends. Prismatic orebodies on the South trend are similar to those found on the Main and North trends except for the apparent absence of tabular karst solution channels.

CURRENT WORK AND RESULTS

In December 1985, Pine Point Mines Ltd. announced a revised mining plan: an accelerated mining plan with the completion of mining in June 1987. By the end of the first quarter of 1986 mining had returned to full capacity and milling, which had been on a reduced schedule in 1985, resumed continuous operation. Production was mainly from six pits, but a small amount of high grade ore came from the underground mine in the western part of the North Hinge.

The test underground operation which began in 1985 was closed in late 1986 so that resources could be used in the N-81 pit. Although higher grade ore than anticipated were recovered from the underground mine, operating costs were high because the ore zone was narrow and the ground conditions were poor.

Mining of the N-81 pit progressed ahead of schedule despite the extensive dewatering required and was completed in the first quarter of 1987.

Exploration in 1986 and 1987 was concentrated on the eastern portion of the property where orebodies are more likely to be closer to surface, therefore having low strip ratios and low dewatering costs. A large, low grade mineralized structure containing a small ore-grade deposit was found.

The amount of ore milled increased from 2.1 Mt in 1985 to 2.9 Mt in 1986 to 3.1 Mt in 1987. At the end of 1987, 739 000 t of ore remained to be milled. Ore reserves for December 31, 1986 were calculated using metal prices forecast for 1987, roughly 8.3 Mt was removed from ore category. Reserves decreased from 13.6 Mt grading 6.3% Zn and 2.5% Pb at the end of 1985 to 3.4 Mt grading 9.6% Zn and 3.5% Pb at the end of 1986. Ore reserves at the end of 1987 were 640 t grading 10.4% Zn and 3.4% Pb.

Pine Point Mines Ltd implemented its abandonment plan. Abandonment and restoration work in the townsite and mining areas will be completed in 1988. Restoration of the millsite and tailings area will be completed in 1991 after all of the concentrate has been shipped.

NANISIVIK MINE

Nanisivik Mines Ltd.	Zinc, lead, silver
12th Floor, 20 Toronto St.	48 C/1
Toronto, Ont., M5C 2B8	73°02'30"N, 84°28'30"W

REFERENCES

Blackadar (1956, 1970); Brophy (1985); Clayton and Thorpe (1982); Curtis, (1984), Jackson and Iannelli (1981); Lemon and Blackadar (1963); Olson (1984)

PROPERTY

A claim, FISH 1-12, HB claim, 22 LION claims, LYNK 1-4

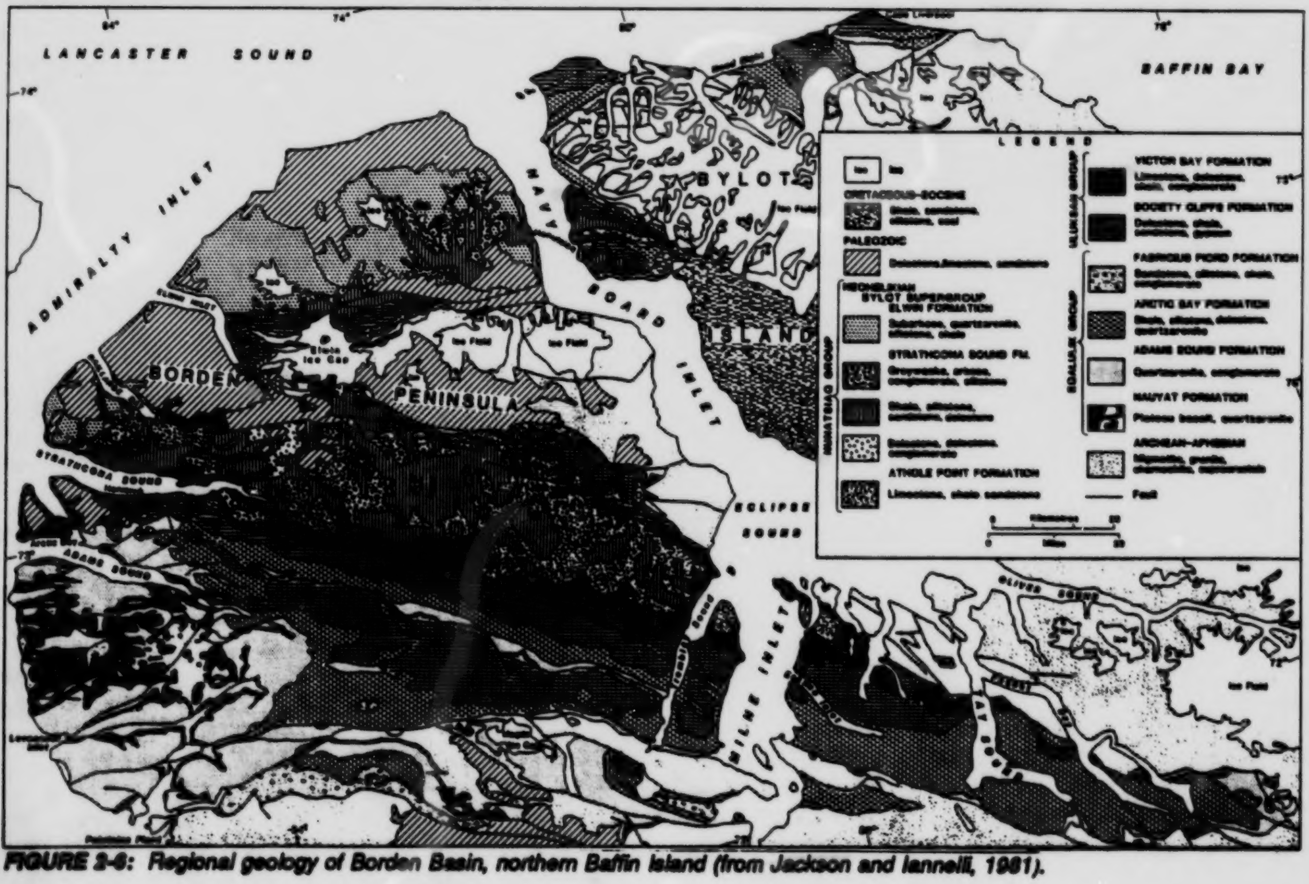

LANCASTER SOUND
BAFFIN BAY
ADMIRALTY INLET
NAVY BOARD INLET
BYLOT ISLAND
BORDEN PENINSULA
ECLIPSE SOUND
MILNE INLET
STRATHCONA SOUND
ADAMS SOUND
OLIVER SOUND
Ice Field
Ice Cap
LEGEND
Ice
CRETACEOUS-EOCENE
PALEOZOIC
BYLOT SUPERGROUP
ELWIN FORMATION
STRATHCONA SOUND FM.
ATHOLE POINT FORMATION
Limestone, shale sandstone
VICTOR BAY FORMATION
SOCIETY CLIFFS FORMATION
FABRICIUS FIORD FORMATION
ARCTIC BAY FORMATION
ADAMS SOUND FORMATION
Quartzarenite, conglomerate
NAUYAT FORMATION
Plateau basalt, quartzarenite
ARCHEAN-APHEBIAN
Fault
Kilometres
Miles

FIGURE 2-6: Regional geology of Borden Basin, northern Baffin Island (from Jackson and Iannelli, 1981).

LOCATION

Nanisivik, on the south shore of Strathcona Sound, on the Borden Peninsula of Baffin Island (Fig. 2-6), is connected by road to Arctic Bay, 27 km to the west.

The community is serviced by twice weekly jet from Montreal. A wharf was built on Strathcona Sound to handle ocean-going ships that transport lead and zinc concentrates to smelters.

HISTORY

In 1910, sulphide minerals were discovered in the Strathcona Sound area by a Dominion Government Expedition. Arthur English was the prospector who made the discovery. Two prospectors, J.F. Tibbett and F. McInnes travelled by dog team from Churchill Manitoba to staked claims in this area in 1937, but only had time to do a limited amount of work on these claims, which were allowed to lapse shortly after.

In his report on the geology of the Strathcona Sound area, Blackadar (1956) described pyrite zone roughly 40 m wide containing galena and sphalerite. The following year Texas Gulf Sulfur Co. Ltd. staked 15 claims that covered in part the eastern end of the Main Lens. Between 1958 and 1969 Texas Gulf Sulfur did geophysical surveys, drilled 30 500 m and collected a bulk sample from an adit driven into the east end of the orebody.

In 1972, the property was optioned to Mineral Resources International (MRI), who commissioned a feasibility study. A decision was made to bring the deposit to production. In 1974, Nanisivik Mines Ltd. was formed to operate the Mine and Strathcona Mineral Services was contracted to manage the project. Production began in September, 1976.

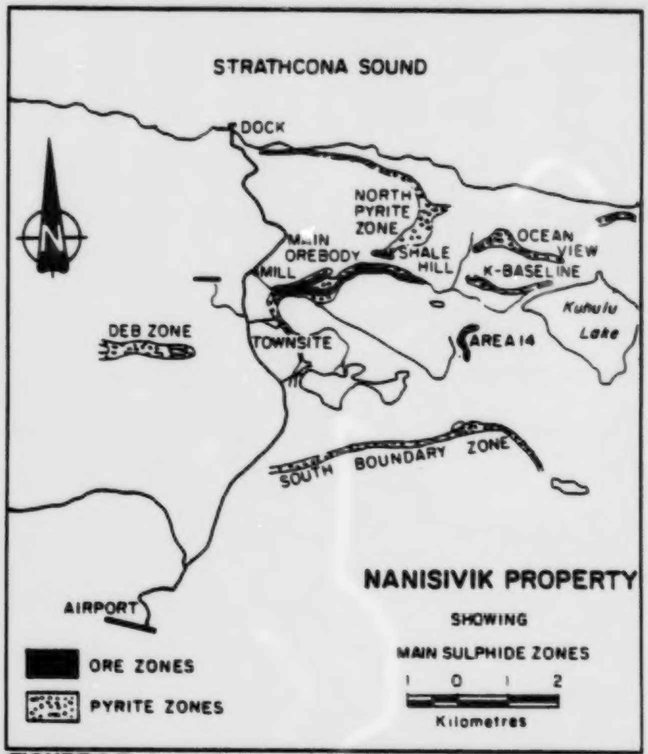


FIGURE 2-7: Lead-zinc deposits and sulphide zones at Nanisivik (from MRI annual report 1985).

DESCRIPTION

Nanisivik is on a major west-northwest trending graben whose long axis underlies and parallels Strathcona Sound (Clayton and Thorpe, 1982). Nanisivik, a lead-zinc-silver deposit, is hosted in Society Cliffs Formation dolomite, which outcrops along a 150 km belt extending from Tay Sound in the east to Admiralty Inlet in the west (Fig. 2-6).

The mine area is underlain mainly by Society Cliffs Formation dolomites, locally conformably overlain by Victory Bay Formation shales. The light grey to black dolomite contains algal laminae is light grey to brown and weathers brown.

Nanisivik is usually classed as a Mississippi Valley-type deposit although its age, geological setting, and high silver and iron content are atypical of Mississippi Valley-type deposits. The Nanisivik deposit is unusual in that it has a higher proportion of iron sulphide (pyrite and marcasite); a high silver content contained in the sphalerite; the host rock and ore are Precambrian in age; and it has high fluid inclusion temperatures.

The deposit comprises Main Lens and a lower Lens connected by a sub-vertical keel zone. The main lens is horizontal, roughly 3 km long, 60 to 120 m wide and 2 to 30 m thick. A diabase dyke crosscuts but does not displace the main lens.

Ore in the main lens comprises distinct layers of sphalerite, galena, pyrite and sparry dolomite gangue. There is very little galena in deposits other than the main lens. Silver is associated with the zinc not the lead, as is common. Silver content in the upper lens is constant along strike, roughly 55 g/t at 10% Zn. Silver content is lower in the central lower lens (30 g/t at 10% Zn) and east lower lens (20 g/t at 10% Zn).

There are four satellite deposits containing mainly pyrite and sphalerite and three massive pyrite zones in addition to the main orebody (Fig. 2-7).

CURRENT WORK AND RESULTS

In September 1986, Nanisivik Mines Ltd. became a wholly-owned subsidiary of MRI following MRI's purchase of the Government of Canada's 18% interest in the property.

Mining was completed in Area 14 deposit in 1986 and production started from Shale Hill and East Lower Lens deposits.

A decrease in production of lead concentrate from 1985 and an increase in silver reflect changes in sources of ore.

Four shipments of concentrate were made during 1986.

In 1987, roughly two thirds of ore milled came from the main lens, the remaining one third from satellite deposits. Silver production was lower than 1986 because of the low silver content of satellite deposits mined during the year. Lead production will continue to be low because satellite deposits being mined contain little galena.

Five shipments of concentrate were made between July and September, 1987.

POLARIS MINE

Cominco Ltd.
200 Granville St.
Vancouver B.C. V6C 2R2

Zinc, Lead
68 H/8
75°23'42"N, 96°56'00"W

REFERENCES

Drake and Keohane (1985); Gibbins (in press); Kerr (1977a, 1977b); Muraro (1973); Scales (1982).

PROPERTY

POLARIS 1-21

LOCATION

Polaris Mine, on the southwest shore of Little Cornwallis Island, is the world's most northerly base metal mine. Resolute Bay, 95 km to the southeast, has commercial jet service several times a weeks from Edmonton and Montreal; passengers and cargo are transported to the minesite by twin otter.

A wharf at the minesite on the Crozier Strait handles ocean-going ships during the 8 to 9 week shipping season.

HISTORY

Lead-zinc showings on Little Cornwallis Island were discovered by geologists working for Bankeno Mines Limited in 1960. The 21 POLARIS claims were staked that year. Exploration continued throughout the 1960's. In 1971, nine holes totally 1830 m were drilled on the Polaris property; all but one hole intersected lead and zinc minerals. Arvik Mines Ltd., owned by Cominco (75%) and Bankeno Mines Ltd. (25%), was formed to develop the lead-zinc deposit.

Underground development was done in 1972-73 to collect a bulk sample. Extensive underground drilling delineated reserves of 23.0 Mt grading 14.1% Zn and 4.3% Pb.

In 1979, Arvik Mines was dissolved and the orebody was turned over to Cominco, with Bankeno retaining a royalty option.

Polaris attained commercial production in March 1982. Primary mining of the Panhandle area was completed by March 1985. Mining operations shifted to the South Keel zone in 1985.

DESCRIPTION

The Polaris deposit is one of many Mississippi Valley-type deposits in the Cornwallis Lead-Zinc District (see chapter 4). The Cornwallis Lead-Zinc District corresponds to the northernmost part of the Cornwallis Fold Belt, which extends more than 650 km from the Precambrian Shield to the Sverdrup Basin (Kerr, 1977a). Thumb Mountain Formation, comprising limestone and minor dolomite, hosts all significant Pb-Zn deposits in the Cornwallis Lead-Zinc District. These stratabound deposits are hosted in brecciated dolomite and are close to overlying Cape Phillips Formation shale, which may have been the source for metals (Kerr, 1977b). The stratigraphy of the area is shown in Figure 2-8.

The Polaris deposit is hosted in dolomitized limestones of the Thumb Mountain Formation (Fig. 2-9). The Thumb Mountain Formation is overlain by green calcareous shales of the Irene

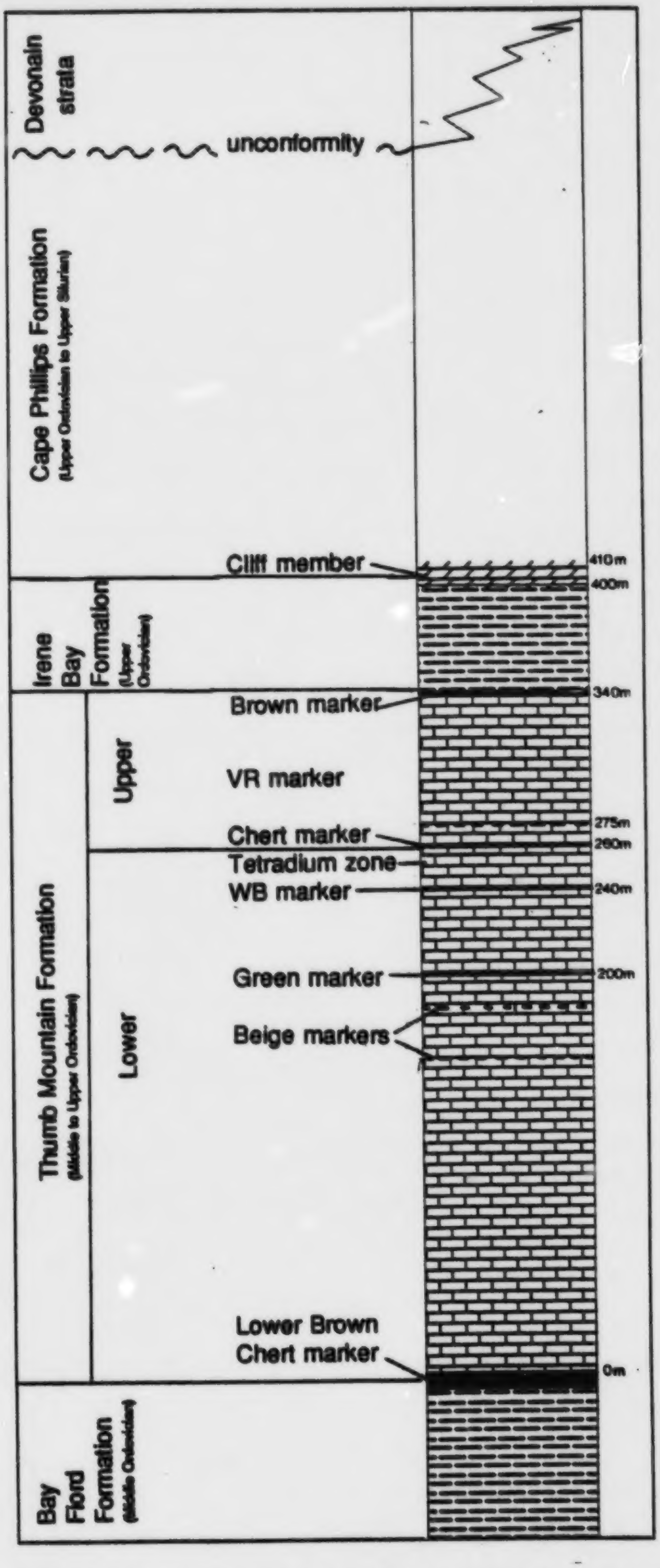
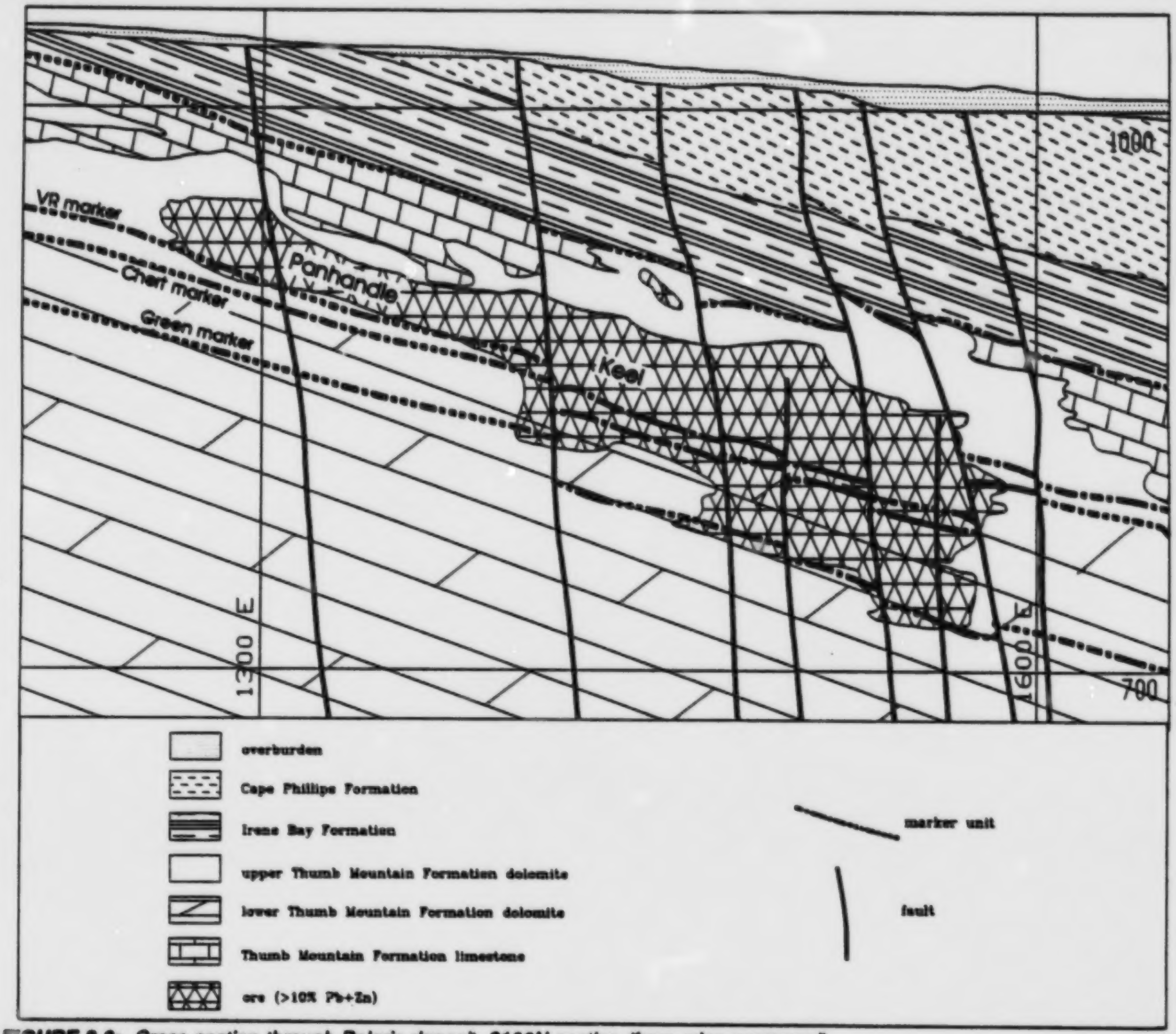

Devonain strata
unconformity
Cape Phillips Formation
(Upper Ordovician to Upper Silurian)
Cliff member
410m
400m
Irene Bay Formation
(Upper Ordovician)
340m
Brown marker
Upper
VR marker
275m
Chert marker
260m
Tetradium zone
WB marker
240m
Thumb Mountain Formation
(Middle to Upper Ordovician)
Lower
Green marker
200m
Beige markers
Lower Brown
Chert marker
0m
Bay Fiord Formation
(Middle Ordovician)

FIGURE 2-8: Stratigraphy of the Polaris deposit (from mine personnel).


1000
VR marker
Chert marker
Green marker
Panhandle
Keel
1300 E
1600 E
700
overburden
Cape Phillips Formation
Irene Bay Formation
upper Thumb Mountain Formation dolomite
lower Thumb Mountain Formation dolomite
Thumb Mountain Formation limestone
ore (>10% Pb+Zn)
marker unit
fault

GURE 2-9: Cross section through Polaris deposit, 2100N section (from mine personnel).

Bay Formation, which are overlain by black bituminous dolomitic shales of the Cape Phillips Formation. Irene Bay Formation is characterized by very soft, incompetent, finely bedded sequence of green shales and shaly nodular limestone. The contact between the Thumb Mountain Formation and the Irene Bay Formation is defined by the Brown marker, medium to coarse-grained, brown mottled dolomite and occasional limestone, which is developed at the top of the Thumb Mountain Formation. Green shales, limestones and evaporites of the Bay Fiord Formation underlie the Thumb Mountain Formation.

The Thumb Mountain Formation is divided into upper and lower members. Upper Thumb Mountain Formation is characterized by coarse to sucrosic nodular dolomite and biomicritic limestone, with argillaceous sections near the top of the unit. Fossils include brachiopod fragments, gastropods, cephalopods, and rugose and tabulate corals. Contact with the lower Thumb Mountain Formation is moderately sharp and defined by the bottom of a zone of dark grey to black nodules, the Chert marker.

Lower Thumb Mountain Formation is characterized by a well bedded sequence of fine grained, brittle, sandy dolomites. The lower Thumb Mountain Formation, clean dense very fine grained to micritic dolomite and limestone, is capped by a 20-25 m thick fossiliferous unit, the Tetradium zone. Individual beds of dolomite range from 10 cm to 1 m in thickness and are generally separated by prominent 1 to 2 cm clay-rich bedding planes. The beds were fractured and brecciated in response to folding and dissolution of certain units. These fractures have been filled and healed by sparry dolomite stringers associated with sphalerite and galena mineralization.

A continuous correlatable stratigraphic unit, Green marker, is 60 to 65 m below the top of the lower Thumb Mountain Formation, near the base of the orebody. The Green marker is haracterized by green fine-grained irregular-shaped blebs and wisps in a dark grey to black breccia matrix.

The Polaris deposit is a north-trending east-dipping stratabound lens; a cross-section through the orebody is shown in Figure 2-9. The orebody has a strike length of 1 km and is open to the north and ranges in width from 100 to 400 m. The orebody is divided into two areas: Panhandle and Keel. The Panhandle, the thinner (5 m to 40 m thick) higher grade relatively shallow up dip section is west of a fault system on the west side of the Keel zone (Fig. 2-9). The Keel zone is the thickest, roughly 100 m thick, and deepest down dip extent of ore. The Keel area is sub-divided into the South Keel, Central Keel and North Keel.

Permafrost extends below the lowest mine workings to a depth of roughly 350 m below sea level. The porosity of the orebody is estimated to be about 5% (Scale, 1982); voids are filled with fresh-water ice. Mining techniques have been adapted for permafrost environment; the ground must remain frozen to maintain ground stability. The temperature of the rock ranges from -12°C near the surface to -4°C at the lowest developed area in the Keel zone (Drake and Keohane, 1985).

Ore minerals are colloform sphalerite and medium- to coarse-grained galena. Gangue minerals are sparry dolomite, marcasite (in P1 and P2 ore), ice and calcite. Ore is developed in the upper 140 m of the Thumb Mountain Formation. The host rock stratigraphy and lithology control and influences the type of mineralization (Gibbins, in press). Ore is divided into five groups based on a combination of mineralogy, structure and stratigraphic position. P1 and P2 ores are developed in the upper Thumb Mountain Formation and the K3, K2 and K1 ores are developed in the lower Thumb Mountain Formation.

P1 ore, the highest grade ore, containing between 15 to 30% Zn, comprises colloform sphalerite, crystalline galena and fine-grained green marcasite. P1 ore is a tabular body that forms the Panhandle zone and caps the Keel zone. It is only type of ore in the Panhandle area. P1 ore approximately follows, but gently transgresses down across the bedding plane of the Upper Thumb Mountain rocks which dip at 20°E throughout the mine area. P2 ore comprises sub-vertical veins and stringers and to a lesser extent bedding parallel veins and breccia. P2 ore is developed above P1 ore, but only in the Keel area where ore is developed below P1 ore. P2 ore has not been found in the Panhandle area of the mine.

K1 to K3 ore is a network of galena/sphalerite veins and irregular masses that underlies the eastern portion of P1 ore. K3 ore, a tabular unit comprising both colloform and crystalline sphalerite and medium to coarse-grained galena, is developed in the upper 25 m of the lower Thumb Mountain Formation. Lenses of Tetradium coquina have been preferentially replaced *in situ* by sulphide minerals. K2 and K1 ore comprise vertical chimneys and stringers, disseminated sulphides and breccias. K1 ore, the lowest stratigraphic ore zone is developed both above and below the Green marker near the base of the Polaris deposit.

CURRENT WORK AND RESULTS

The Polaris deposit is mined using sublevel blasthole stoping in primary stopes. Primary mining of the Panhandle area was completed in early 1985. Pillar recovery began in the fall of 1985, and the first pillar had been removed by September 1986. Pillar recovery is expected to be roughly 80% (personal communication, mine staff). The Keel zone continued to be developed and mined during 1986 and 1987. Diamond drilling tested the Keel zone for southern extensions.

Grades for both lead and zinc concentrate were high than previous years because of improvements made to the mill. The grade for zinc in concentrate was 62.8% in 1986 and 62.5% in 1987, up from a high of 61.8% in 1985. The grade for lead in concentrate was 78.4% in 1986 and 79% in 1987, up from 76.2% in 1985.

In 1986, 886 000 t of ore was milled, down from 939 000 t in 1985, because of a six week shut down to control concentrate inventory levels. A record high of 983 800 t of ore was milled in 1987.

In 1986, Polaris produced 182 100 t of zinc concentrate containing roughly 114 360 t of zinc, and 32 000 t of lead concentrate containing roughly 25 088 t of lead. In 1987, 206 100 t of zinc concentrate containing roughly 128 812 t of zinc, and 33 600 t of lead concentrate containing roughly 26 544 t of lead were produced.

Since production began in 1982, 1 099 300 t of zinc concentrate containing 674 690 t of zinc and 234 500 t of lead concentrate containing 179 100 t of lead has been recovered from 4 926 900 t of ore.

To account for lose of ore in pillars, reserves were decreased by 2 721 600 t in 1987. Reserves at the end of 1987 were 15 060 000 t at 14.4% Zn and 3.9% Pb,which provide for 16 years production at current production rates.

CANTUNG MINE

Canada Tungsten Mining Tungsten
Corp. Ltd. 105 H/16
P.O. Box 9
61°57'45"N,
Tungsten, NWT, X0A 0A0 128°15'W

REFERENCES

Cummings and Bruce (1977); Gabrielse and others (1973); Mulligan (1984); Skinner (1961)

PROPERTY

AC 1-7, BC 1-8, 10-11, CED 1-49, 59-65, 67-73, EF 2, 5-8, RL 1, 3-5, 8-10, 19-20, WO 1-11

LOCATION

Cantung Mine, on the southwest side and near the head waters of the Flat River (Fig. 2-10), is roughly 3 km from the Yukon border. A 306 km all-weather gravel road connects Tungsten to Watson Lake, Yukon. A 1220 m gravel airstrip services the community.

HISTORY

The Pit orebody was discovered by Axel Berglund in 1954. He was prospecting for Northwestern Exploration Limited and staked it as a copper prospect. The deposit was mapped and sampled and the area was mapped in 1955. After 7 holes were drilled in 1956, it was determined that both size and grade were sub-economic for a copper deposit.

During the late 1950's, prospectors working for the Mackenzie Syndicate discovered scheelite while panning on the Flat River. Meanwhile the showing had been drilled by Kennecott Copper. The company, not finding a suitable grade or size for a copper deposit, allowed the claims to lapse in the fall of 1958. The Mackenzie Syndicate immediately restaked the ground as the WO claims.

Early in 1959 the showing was sampled and the Canada Tungsten Mining Corporation Limited was formed to acquire and develop the property. Extensive surface work and diamond drill during 1959 and 1960 outline 1 067 230 t of indicated ore reserves grading 2.47% WO_3.

In 1961 a 25 m exploratory adit was driven and 95 m of drifting explored the orebody. A 270 t/d plant was built. An all-weather road connecting the mine to Watson Lake was completed in 1962.

Original plans called for extraction of the Pit orebody using underground mining methods. In 1967 the reserves were recalculated based on using only open pit mining methods.

In 1971, the life of the mine was extended when exploration drilling intersected a skarn zone 550 m north and 240 m lower than the Pit orebody. Drilling to test the discovery continued in 1972. In the fall a production size adit was advanced 133 m to enable exploration of the 'E' zone orebody.

In 1973 upon verification of E-zone orebody by diamond drilling a decision was made to take only higher grade skarn ore from the open pit and to develop the E-zone for production. After remaining open pit ore had been milled, the mill was converted to process E-zone ore. Ore from underground started to be milled in mid-June 1974.

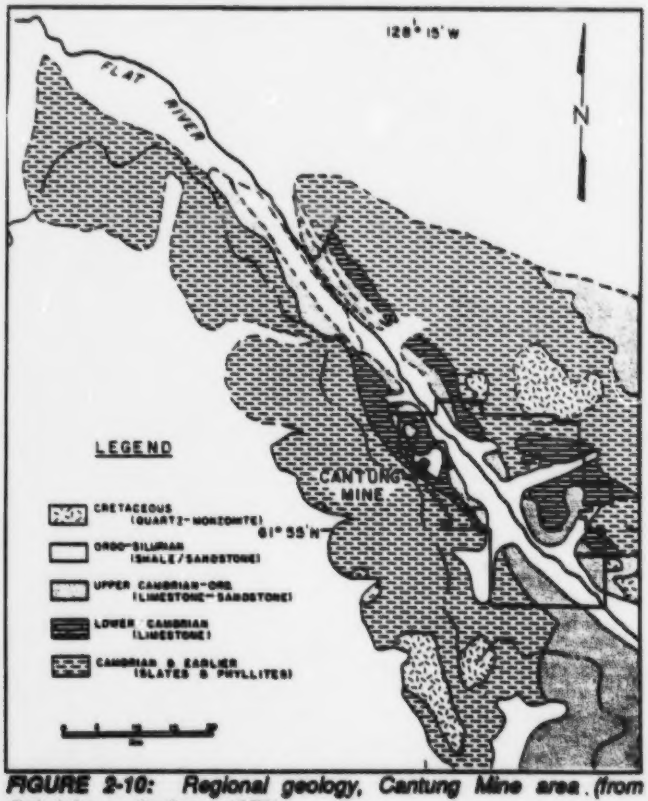

128° 15' W
N
FLAT RIVER
CANTUNG MINE
61° 55' N
LEGEND
CRETACEOUS (QUARTZ-MONZONITE)
ORDO-SILURIAN (SHALE / SANDSTONE)
UPPER CAMBRIAN-ORD. (LIMESTONE-SANDSTONE)
LOWER CAMBRIAN (LIMESTONE)
CAMBRIAN & EARLIER (SLATES & PHYLLITES)

FIGURE 2-10: Regional geology, Cantung Mine area. (from Gabrielse and others, 1973).

Because the E-zone is not as competent in the western part, bulk mining using large diameter blast holes was introduced in 1984 (Brophy, 1987). Room and pillar mining method had been used in the eastern portion of the orebody.

In 1985, a new management team was organized and a revised mining plan was completed by J.S. Redpath Ltd. Based on the work of J.S. Redpath and the Cantung engineers, the estimate of mineral ore reserves was reduced by almost 50%.

DESCRIPTION

The area is underlain by a thick series of sedimentary rocks ranging in age from late Precambrian to Upper Cambrian. In the Flat River area the Cambrian sediments grade from quartzite and dolomite in the northeast to shale an argillite with minor carbonates in the southwest. Several granitic stocks have intruded the sediments. All tungsten showings in this area are associated with the metamorphic aureoles developed around the granitic intrusions.

The dominant structure in the area is a northwest-trending syncline. The Flat River flows through the trough of the syncline. The sedimentary rocks on the southwest limb of the syncline have been folded into overturned small tight folds. A quartz-monzonite stock, the 'Mine stock' intruded the sedimentary sequence during the Cretaceous, altering the limestone to skarn.

Ore-bearing skarns are hosted in two distinct units: Ore limestone and Swiss cheese limestone. Ore limestone a blue-grey finely laminated recrystallized limestone or marble unit, roughly 60 m thick, hosts 'skarn ore'. Swiss cheese limestone a dolomitic siltstone containing pods and lenses of impure limestone, hosts 'chert ore'.

Two deposits have been mined at Cantung (Fig. 2-11). The Pit orebody in the floor of a cirque at an elevation of 1524 m and the E-zone orebody at an elevation of 1220 m and roughly 550 m north of the pit zone.

The main zone of Pit orebody, not including chert ore, was roughly 200 m long, 90 m wide and 20 m thick. The orebody is cut by a fault on the south side and dips northward and pinches out with no structural cause (Cummings and Bruce, 1977). The Pit orebody, developed in both Ore limestone and Swiss Cheese lime-stone, comprises diopside-hedenbergite-garnet skarn with quartz, calcite, scheelite, microcline, and locally abundant pyrrhotite.

The E-zone is an east-trending lens over 820 m long roughly 12 m thick and with a slope width of 150 m. It dips on average 20° south. Ore terminates where it is truncated by the underlying intrusive and where the Ore Limestone thins out. The E-zone, which is developed only in the Ore Limestone, has less pyroxene-garnet skarn than the pit orebody, but has abundant pyrrhotite. Amphibole is in fractures in the lower part of the zone and in bands with pyrrhotite and scheelite. Biotite is in the lower part of the skarn near the granite contact. Scheelite-bearing quartz veins cut both E-zone and Pit orebody skarns.

The differences between the mineralogy of the two deposits are due to the positions of the orebodies relative to the Mine Stock. The E-zone underwent more intense metasomatism of its proximity to the contact with the underlying granite (Mulligan, 1984).

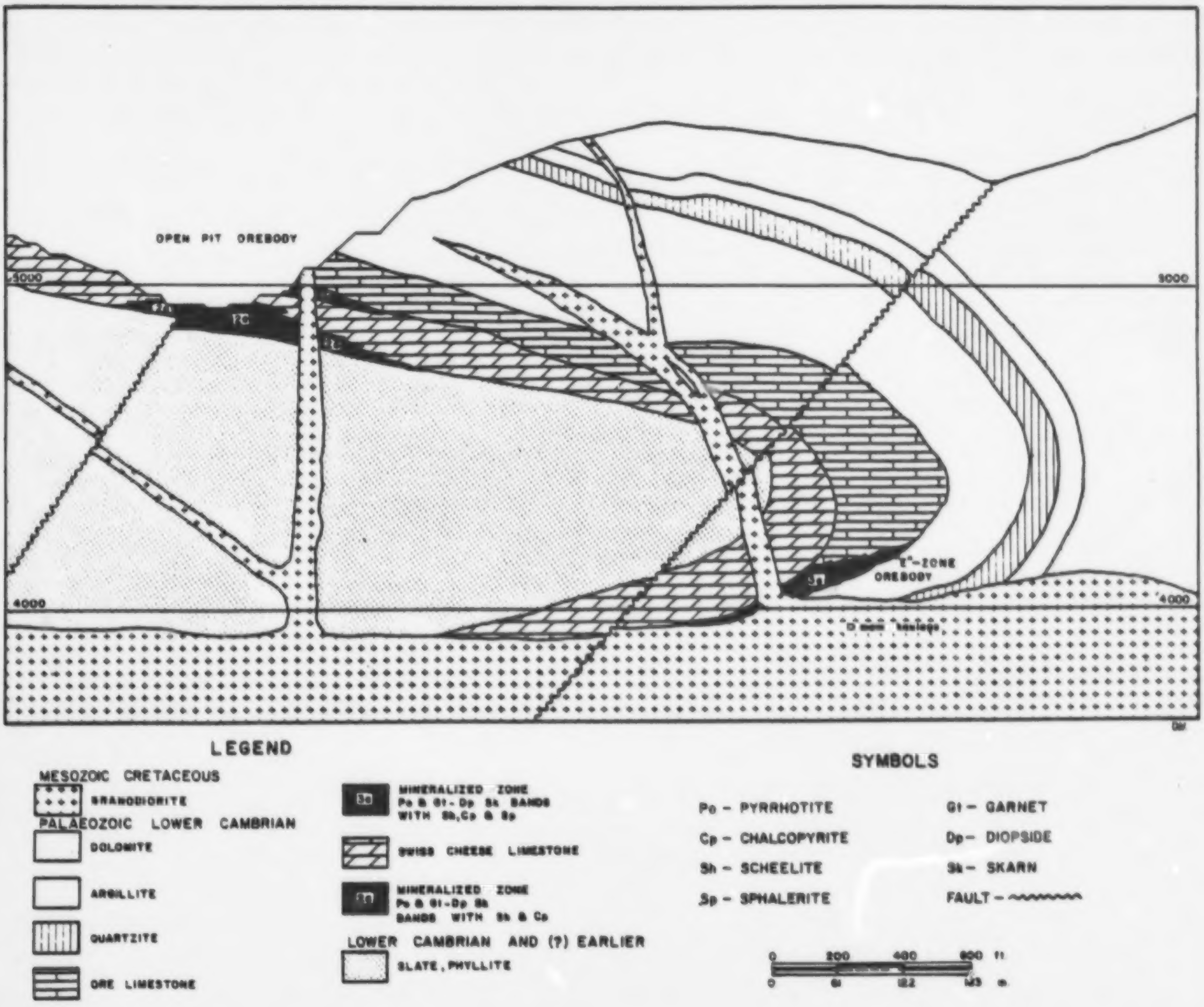

OPEN PIT OREBODY
5000
5000
PC
4000
4000
E-ZONE OREBODY
LEGEND
MESOZOIC CRETACEOUS
GRANODIORITE
PALAEOZOIC LOWER CAMBRIAN
DOLOMITE
ARGILLITE
QUARTZITE
ORE LIMESTONE
MINERALIZED ZONE Po & Gt-Dp Sk BANDS WITH Sh, Cp & Sp
SWISS CHEESE LIMESTONE
MINERALIZED ZONE Po & Gt-Dp Sk BANDS WITH Sh & Cp
LOWER CAMBRIAN AND (?) EARLIER
SLATE, PHYLLITE
SYMBOLS
Po - PYRRHOTITE
Cp - CHALCOPYRITE
Sh - SCHEELITE
Sp - SPHALERITE
Gt - GARNET
Dp - DIOPSIDE
Sk - SKARN
FAULT - ~~~~~~
0 200 400 600 ft
0 61 122 183 m

FIGURE 2-11: Cross section through Cantung Mine area showing the Open pit and E-zone orebodies (after Cummings and Bruce, 1977).

CURRENT WORK AND RESULTS

In May, 1986, a strike force halted operations at Cantung; operations at Canada's only tungsten mine were suspended indefinitely in August 1986 because of depressed tungsten prices. The price for scheelite dropped from US$84/STU in 1984 to US$50/STU in 1986. The mine may reopen if the price increases and the market for tungsten shows stability.

Since 1962, a roughly 15 133 665 t of ore have been mined from the two orebodies: 1 221 245 t of ore from the pit and from 2 912 420 t of ore from underground. The E-zone has yielded 3 818 115 STU WO_3, containing roughly 27 470 t W.

REFERENCES

Anderson, G.M. and Macqueen, R.W., 1982:
Ore deposit models-6, Mississippi Valley-Type lead zinc deposits; Geoscience Canada, v. 9, no. 2, pp. 108-117.

Beales, F.W. and Jackson, S.A., 1966:
Precipitation of lead-zinc ores in carbonate reservoirs as illustrated by Pine Point ore field, Canada; Institution of Mining and Metallurgy, Transactions, Section B, Applied Science, London, v. 75, pp. B278-285.

_____, 1968:
Pine Point - a stratigraphical approach; CIM Bulletin, v. 61, pp. 867-878.

Blackadar, R.G., 1956:
Geological reconnaissance of Admiralty Inlet, Baffin Island, Arctic Archipelago, NWT; Geological Survey of Canada, Paper 55-6, 25 p.

_____, 1970:
Precambrian geology of northwestern Baffin Island, District of Franklin; Geological Survey of Canada, Bulletin 191, 89 p.

Blusson, S.L., 1968:
Geology and tungsten deposits near the headwaters of Flat Creek, Yukon Territory and southern District of Mackenzie; Geological Survey of Canada,

Paper 67-22, 77 p.

Bostock, H.H., 1980:
Geology of the lichen Lake area, District of Mackenzie; Geological Survey of Canada, Memoir 391, 101 p.

Boyle, R.W., 1961:
The geology, geochemistry and origin of the gold deposits of the Yellowknife District; Geological Survey of Canada, Memoir 310, 193 p.

Brophy, J.A., 1983:
Operating Mines; *in* Mineral Industry Report, NWT, 1979; NWT Geology Division, DIAND, EGS 1983-9, pp. 11-52.

_____, 1984:
Operating Mines: *in* Mineral Industry Report, NWT,
1980-1981; NWT Geology Division, DIAND, EGS 1984-5, pp. 21-81.

_____, 1985:
Operating Mines; *in* Mineral Industry Report, 1982-83; NWT Geology Division, DIAND, EGS 1985-4, pp. 13-74.

_____, 1986:
Structural setting, age and wallrock geochemistry of auriferous quartz veins in turbidites of the Yellowknife Supracrustal Basin; *in* Exploration Overview, NWT, 1986, NWT Geology Division, DIAND, pp. 18

_____, 1987:
Tom and Ptarmigan Mines; *in* Yellowknife Guide Book ed W.A. Padgham, pp. 195-198.

Brown, C.J., 1961:
The Geology of the Flat River Tungsten Deposits, Canada Tungsten Mining Corporation Ltd., CIM Bulletin, v. 64, pp. 311-314.

Bullis, H.R., Prasico, V.V. and Webb, D.R., 1987
The Con Mine; *in* Yellowknife Guide Book ed W.A. Padgham, pp. 175-182.

Caine, T.W. and Brown, D.D., 1987:
Mines and Mineral Deposits of the Yukon and Northwest Territories, DIAND.

Campbell, N., 1947:
The West Bay Fault, Yellowknife; Transactions Canadian Institute of Mining and Metallurgy, v. 50, pp. 509-526.

_____, 1987:
Tectonics, reefs and stratiform lead-zinc deposits of the Pine Point area, Canada; Economic Geology Monograph 3, pp. 59-70.

Christie, R.L., Cook, D.G., Nassichuck, W.W., Trettin, H.P. and Yorath, C.J., 1972:
The Canadian Arctic Islands and the Mackenzie Region; 24th International Geological Congress, Guidebook Excursion A-66, 146 p.

Clayton, R.H. and Thorpe, L., 1982:
Geology of the Nanisivik zinc-lead deposit; *in* Procambrian sulfide deposits, R.W. Hutchinson, C.D. Spence and J.M. Franklin, eds.; Geological Association of Canada, Special Paper 25, pp. 739-758.

Cumming, G.L. and Robertson, D.K., 1969:
Isotopic composition of lead from the Pine Point deposit; Economic Geology, v. 64, pp. 731-732.

Cummings, W.W. and Bruce, D.E., 1977:
Canada Tungsten - change of underground mining and description of mine-mill procedures; *in* CIM Bulletin, v. 70, no. 784, pp. 94-101.

Curtis, L.W., 1984:
Nanisivik Report; internal report for Nanisivik Mines Ltd., by Curtis and Associates Inc., Toronto.

Dawson, K.M. and Dick, L.A., 1978:
Regional metallogeny of the Northern Cordillera: Tungsten and base metal-bearing skarns in southeastern Yukon and southwestern Mackenzie; *in* Current Research, Part A, Geological Survey of Canada, Paper 78-1A, pp. 287-292.

Dick, L.A., 1980:
A comparative study of the geology, mineralogy and conditions of formation of contact metasomatic mineral deposits in the northeastern Canadian Cordillera; Unpub. Ph.D. Thesis, Queen's University, Kingston, Ontario, 473 p.

Dick, L.A. and Hodgson, C., 1982:
The Mactung W-Cu (Zn) contact metasomatic and related deposits of the northeastern Canadian Cordillera; Economic Geology v. 77, no. 4, pp. 845-867.

Dillon-Leitch, C.H., 1981:
Volcanic stratigraphy, structure and metamorphism in the Courageous-Mackay Lake greenstone belt, Slave Province, NWT; unpublished M.Sc. Thesis, University of Ottawa, 169 p.

_____, 1984:
Geological mapping of the Courageous Lake-Mackay Lake greenstone belt, Slave Province, NWT; NWT Geology Division, DIAND, EGS 1984-4.

Drake, J.S. and Kechane, P.G., 1985:
The Polaris Mine; CIM Bulletin, v. 78, no. 880, pp.49-53.

Ellis, C.E., 1988:
Operating mines *in* Exploration Overview, NWT 1988, NWT Geology Division, DIAND, pp. 7-9.

EMR, 1987:
Canadian Minerals Yearbook 1986, review and outlook; Mineral Report 35, ed. G. Cathcart, Mineral Policy Sector, Energy , Mines and Resources Canada.

EMR, 1988,
Canadian Minerals Yearbook 1987, review and outlook; Mineral Report 36, ed. G. Cathcart, Mineral Policy Sector, Energy , Mines and Resources Canada.

EMR, 1989:
Canadian mineral deposits not being mined in 1989; *in* Mineral Bulletin MR 223, November 1989.

Fish, R., 1979:
The place where people find things, Nanisivik; Canadian Mining Journal, Sept. 1979.

Folinsbee, R.E. and Moore, J.C., 1950:
Matthews Lake, NWT; Geological Survey of Canada, Paper 50-2.

Ford, D.C., 1982:
Karstic features of the zinc-lead main ore deposit at Nanisivik, Baffin Island; Geological Association of Canada, program with abstracts, v. 7, pp. 49.

Fraser, J.A., 1964:
Geological note on northeastern District of Mackenzie, NWT; Geological Survey of Canada, Paper 63-28.

Gabrielse, H. and Blusson, S.L., 1967:
Geology of Coal River map area, Yukon Territory and District of Mackenzie; Geological Survey of Canada, Map 11-1968.

Gabrielse, H., Blusson, S.L., and Roddick, J.A., 1973:
Geology of Flat River, Glacier Lake and Wrigley Lake map-areas, District of Mackenzie and Yukon Territory; Geological Survey of Canada, Memoir 366 part I, 153 p.

Gabrielse, H. and Reesor, J.E., 1974:
The nature and setting of granitic plutons in the central and eastern parts of the Canadian Cordillera; Pacific Geology 8, pp. 109-138.

Geldsetzer, H., 1973a:
The tectonic-sedimentary development of an algal dominated Helikian succession of Northern Baffin Island, NWT; *in* Canadian Arctic Geology Symposium, J.D. Aitken and D.J. Glass, eds.; Geological Association of Canada and Canadian Society Petroleum Geology, Memoir 18, pp. 99-126.

_____, 1973b:
Syngenetic dolomitization and sulfide mineralization; *in* Ores in sediments, Springer-Verlag, pp. 115-127.

Gibbins, W.A., 1981:
Gold and Precambrian iron-formation in the NWT; *in* Proceedings of the Gold workshop, R.D. Morton, ed., Yellowknife, NWT, Dec. 3-7, 1979, pp. 258-287.

_____, 1982:
Mining developments, mineral inventory and metallogenic models: Arctic regions, NWT, Canada; *in* Arctic Geology and Geophysics, A.F. Embry and H.R. Balkwill, eds.; Canadian Society Petroleum Geology, Memoir 8, pp. 113-133.

_____, 1983:
Mississippi Valley-Type lead-zinc districts of northern Canada; *in* International Conference (no. "5") on Mississippi Valley-Type lead-zinc deposits, University of Missouri-Rolla.

_____, in press:
Economic Minerals, Canada; *in* Decade of North American Geology, v.20 ch. 20D.

Gibbins, W.A., Seaton, J.B., Laporte, P.J., Murphy, J.D., Hurdle, E.J. and Padgham, W.A., 1977:
Mineral Industry Report 1974, Northwest Territories; NWT Geology Division, DIAND, EGS 1977-5, pp. 108.

Helmstaedt, H. and Padgham, W.A., 1986:
A new look at the stratigraphy of the Yellowknife Supergroup at Yellowknife, NWT: implications for the age of gold-bearing shear zones and Archean basin evolution; Canadian Journal of Earth Science, v.23 pp. 454-475.

Henderson, J.B., 1975:
Sedimentology of the Archean Yellowknife Supergroup at Yellowknife, District of Mackenzie; Geological Survey of Canada, Bulletin 246, 62 p.

_____, 1985:
Geology of the Yellowknife-Hearne Lake area, District of Mackenzie: A segment across an Archean basin; Geological Survey of Canada, Memoir 414, 135 p.

Henderson, J.F. and Brown I.C., 1966:
Geology and structure of the Yellowknife Greenstone Belt, District of Mackenzie; Geological Survey of Canada, Bulletin 141, 87 p.

Iannelli, T.R., 1979:
Stratigraphy and depositional history of some Upper Proterozoic sedimentary

rocks on northwestern Baffin Island, District of Franklin; *in* Current Research, Part A, Geological Survey of Canada, Paper 79-1A, pp. 45-56.

Jackson, G.D. and Iannelli, T.R., 1981:
Rift-related cyclic sedimentation in the Neohelikian Borden Basin, northern Baffin Island, *in* Proterozoic basins of Canada, F.H.A. Campbell, ed.; Geological Survey of Canada, Paper 81-10, pp. 264-302.

Jackson, G.D. Iannelli, T.R., Narbonne, G.M., and Wallace, P.J., 1978:
Upper Proterozoic sedimentary and volcanic rocks of northwestern Baffin Island; Geological Survey of Canada, Paper 78-14.

Jackson, G.D., Iannelli, T.R., and Tilley, B.J., 1980:
Rift-related late Proterozoic sedimentation and volcanism on northern Baffin and Bylot Islands, District of Franklin; *in* Current Research, Part A, Geological Survey of Canada, Paper 80-1A, pp. 319-328.

Jackson, S.A. and Beales, F.W., 1967:
An aspect of sedimentary basin evolution: The concentration of Mississippi Valley-type ores during late stages of diagenesis, Bulletin Canadian Society of Petroleum Geology, v. 15, pp. 383-433.

Jowett, E.C., 1975:
Nature of ore-forming fluids of the Polaris lead-zinc deposit, Little Cornwallis Island, NWT, from fluid inclusion studies; CIM Bulletin, no. 68, pp. 124-129.

Kerr, J. Wm., 1977a:
Cornwallis Fold belt and the mechanism of basement uplift; Canadian Journal of Earth Science, v. 14, no. 6, pp. 1374-1401.

____, 1977b:
Cornwallis lead-zinc districts Mississippi Valley-type deposits controlled by stratigraphy and tectonics; Canadian Journal of Earth Science, v. 14, no. 6, pp. 1402-1426.

Kerswill, J.A., Woollett, G.N., Strachan, D.M., and Gardiner, J., 1983:
Geological setting and gold distribution at the Lupin gold deposit, Contwoyto Lake area, NWT; abstracts District 5 CIM Conference, Calgary, Sept. 7-9, 1983.

King, J.E., Davis, W.J., Relf, C. and Avery, R.W., 1988:
Deformation and plutonism in the western Contwoyto Lake map area, central Slave Province, District of Mackenzie, NWT; *in* Current Research, Part C, Geological Survey of Canada, Paper 88-1C, p. 161-176.

King J.E., Davis, W.J., Van Nostrand, T. and Relf, C. 1989:
Archean to Proterozoic deformation and plutonism of the western Contwoyto Lake map area, central Slave Province, District of Mackenzie, NWT; *in* Current Research, Part C, Geological Survey of Canada, Paper 89-1C, pp. 81-94.

Kyle, J.R., 1980:
Controls of lead-zinc mineralization, Pine Point District, NWT; Mining Engineering, v. 32, no. 11, p, 1617-1626.

____, 1981:
Geology of the Pine Point lead-zinc District; *in* Handbook of stratabound and stratiform ore deposits, K.H. Wolf, ed.; v. 9, Regional studies and specific deposits; Amsterdam, Elsevier, pp. 643-741.

Lajoie, J.J. and Klein, J., 1979:
Geophysical exploration at the Pine Point Mines Ltd. zinc-lead property, NWT, Canada; *in* Geophysics and geochemistry in the search for metallic ores; P.J. Hood, ed.; Geological Survey of Canada, Economic Geology Report 31, pp. 653-664.

Lemon, R.R.J. and Blackadar, R.G., 1963:
Admiralty Inlet Area, Baffin Island, District of Franklin; Geological Survey of Canada, Memoir 328, 84 p.

Lewis, 1987:
Giant Yellowknife Mine, overview; *in* Field Guide, Yellowknife Mining District, W.A. Padgham ed., The Yellowknife Geo-workshop Committee, pp. 191-193.

Lord, C.S., 1941:
Mineral Industry of the NWT; Geological Survey of Canada, Memoir 230, 136 p.

____, 1951:
Mineral Industry of District of Mackenzie, NWT; Geological Survey of Canada, Memoir 261, 336 p.

Macqueen, R.W. and Powell, T.G., 1983:
Organic geochemistry of the Pine Point lead-zinc ore field and region; Economic Geology v. 78, no. 1, pp. 1-25.

Macqueen, R.W., Williams, G.K., Barefoot, R.R. and Foscolos, A.F., 1975:
Devonian metalliferous shales, Pine Point regions, District of Mackenzie; Geological Survey of Canada, Paper 75-1 Part A, pp. 553-556.

Mathieson, G.A. and Clark, A.H., 1984:
The Cantung E-Zone scheelite skarn orebody, Tungsten, NWT, a revised genetic model; Economic Geology, v. 79, no. 5, pp. 883-901.

Moore, J.C.G., 1951:
Courageous Lake, NWT; Geological Survey of Canada, Paper 51-14.

____, 1956:
Courageous-Matthews Lake area, District of Mackenzie, NWT; Geological Survey of Canada, Memoir 283, 52 p.

Mulligan, R., 1984:
Geology of Canadian Tungsten Occurrences; Geological Survey of Canada, Economic Geology Report 32, 121 p.

Muraro, T.W., 1973:
Lead-zinc mining on Little Cornwallis Island; Canadian Society of Exploration Geophysicists, First National Convention, Calgary, Alta., Proceedings, pp. 230-234.

Olson, R.A., 1977:
Geology and genesis of zinc-lead deposits within a late Proterozoic dolomite, Northern Baffin Island, NWT; Unpub. Ph.D. Thesis, University of British Columbia, Vancouver, B.C.

____, 1984:
Genesis of paleokarst and stratabound zinc-lead sulfide deposits in a Proterozoic dolostone, northern Baffin Island, Canada; Economic Geology, v. 79, no. 5, pp. 1056-1103.

____, 1985:
Turbidite hosted gold quartz veins in the Slave Province, NWT; *in* Geological Association of Canada Special Paper 32, p. 119-134.

____, 1987:
Yellowknife Volcanic Belt: Setting and Stratigraphy; *in* Field Guide, Yellowknife Mining District, W.A. Padgham, ed., The Yellowknife Geo-workshop Committee, p. 11-20.

Padgham W.A. and Brophy, J.A., 1986:
Gold deposits of the NWT; paper presents at 87th annual CIMM AGM, April 1985, Vancouver B.C., 25 p.

Ransom, A.H., 1983:
History and a preliminary update on the geology of the Salmita gold mines, Courageous Lake, NWT; CIM Paper n. 8, First district 5 meeting, Calgary, Alta., Sept. 7-9, 1983.

Ransom, A.H. and Robb, M.E., 1985:
The Salmita Gold Deposit; CIM Paper n. 52, 87th Annual General Meeting of CIM, 1985, 20 p.

Rhodes, D., Lantos, E.A., Lantos, J.A., Webb, R.J. and Owens, D.C., 1984:
Pine Point orebodies and their relationship to the stratigraphy, structure, dolomitization and karstification of the Middle Devonian barrier complex; Economic Geology, v. 79, no. 5, pp. 991-1055.

Scales, M. 1982:
High Arctic wizardry, Polaris Mine on stream; Canadian Mining Journal, July, 1982.

Skall, H., 1975:
The paleoenvironment of the Pine Point lead-zinc district; Economic Geology, v. 70, pp. 22-45.

____, 1976:
Controlling factors for the localization of lead-zinc mineralization at Pine Point; CIM Bulletin, v. 69 no. 773, p. 68.

Skinner, R., 1961:
Mineral Industry of Yukon Territory and Southwestern District of Mackenzie, 1960; Geological Survey of Canada, Paper 61-23, 48 p.

Strachan, D.M. and Moffett, R., 1985:
Geology of the Lupin gold deposit, Lupin, NWT; paper presented to the Northwest Mining Association 91st annual convention, Spokane, Washington, 13 p.

Swatton, S., 1985:
The Bullmoose Project, University of Alberta, October 1985.

Thorsteinsson, R. and Kerr, J. Wm., 1968:
Cornwallis and adjacent smaller islands, Canadian Arctic Archipelago; Geological Survey of Canada, Pap 67-64.

____, 1976:
Geology of northern Contwoyto Lake area, District of Mackenzie; Geological Survey of Canada, Memoir 381, 56 p.

Webb, R.J., 1986:
Localization of Prismatic Orebodies by Stratigraphic/Structural Controls, South Trend, Pine Point Lead-Zinc Property, NWT; unpublished M.Sc. thesis, University of Waterloo, Waterloo, Ontario, 250 p.

Yates, A.B., 1975:
Nanisivik; CIM Bulletin, v. 62, no 763, pp. 71-78.

Zaw, U.K., 1976:
The Cantung E-Zone orebody, Tungsten, NWT: a major scheelite skarn deposit; Unpub. M.Sc. Thesis, Queen's University, Kingston, Ontario.

CHAPTER 3
CORDILLERAN DISTRICT

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INTRODUCTION

The Cordilleran District extends from the Beaufort Sea south to the B.C. border and from the Yukon border to Great Bear Lake and Great Slave Lake (Fig. 3-1). It is subdivided into the Mackenzie Platform and the Selwyn Basin (Fig. 3-2). Selwyn Basin and Mackenzie Platform west of Mackenzie Arch comprise the Cordilleran miogeocline, a prism of sedimentary rocks of Precambrian to Jurassic age deposited along the relatively stable continental margin of North America (Abbot *et al.*, 1986).

Selwyn Basin represents part of the outer miogeocline (Cecile, 1982). Mackenzie Platform represents the inner miogeocline. The transition from platformal limestone to basinal carbonaceous mudstone and chert is diachronous.

Sedimentary sequences of the miogeocline are grouped (Abbot *et al.*, 1986):

1. Late Proterozoic Windermere Supergroup, a westward thickening wedge of clastic sediments, the lower part of which, at least, reflects deposition along a newly rifted margin of western North America (Young *et al.*, 1979). Mineral deposits (Table 3-1) include stratabound-Redstone copper belt and the Crest iron deposit.
2. Early Cambrian to Middle Devonian westward thickening, shallow water clastic rocks and shelf carbonates of the inner miogeocline and thinner, deep water, clastic dominated strata of the outer miogeocline. Passive sedimentation was interrupted by periodic extensions marked by unconformities and volcanics. Mineral deposits of the inner miogeocline are carbonate-hosted stratabound zinc-lead deposits, such as the Gayna River and Bear-Twit deposits, and silver-lead-zinc vein deposits filling fractures and faults, such as the Cadillac Creek deposit; and of the outer miogeocline are shale-hosted zinc-lead deposits, such as the Howards Pass deposit.
3. Middle Devonian and Mississippian transgressive westerly derived clastics: coarse-grained in the outer miogeocline, Lower Earn Group; and, fine-grained in the inner. Mineral deposits include stratiform sediment-hosted zinc-lead (silver-barite) deposits, such as the Jason and Tom deposits and barren barite deposits (Abbot *et al.*, 1986; Lydon *et al.*, 1985).
4. Mississippian to Triassic stable, marine, shallow water clastics which host barren barite deposits, such as the TEA deposit (Abbot *et al.*, 1986; Lydon *et al.*, 1985). Platformal strata also include marine coal-bearing sequences (Reindeer Formation and Coal-bearing division, Table 3-1) and non-marine coal sequences (Moose Channel Formation) (Long, 1986).

Sedimentary sequences of the Cordillera in the NWT are variably and polydeformed. This reflects repeated and complex accretion further to the west of allochthonous terranes with the North American craton between Devonian and Tertiary time (Monger *et al.*, 1972). In the western NWT, rocks may be folded, thrusted, rifted and offset by strike-slip faulting to form the Mackenzie Fold Belt (Douglas *et al.*, 1970). Mid-Cretaceous granitoid intrusives of the Selwyn Plutonic Suite (Anderson, 1982, 1983) were emplaced following an episode of collision, the Laramide Orogeny, and are associated with tungsten skarns, including MacTung and Cantung (Table 3-1). East of the Mackenzie Fold Belt, rocks of the Mackenzie Platform are relatively undisturbed (Macqueen, 1976).

Exploration in the NWT Cordillera was low, due in part to depressed commodity prices for lead, zinc, tungsten and copper during 1986 and 1987. Tungsten prices declined from (US) $68/STU in 1985 to $43/STU in 1986 to $31.42/STU in 1987 resulting in closure of Canada Tungsten Mining Corporation's Cantung Mine on August 12, 1986. Canada Tungsten continued to ship concentrate from its stockpile during 1987. Canada Tungsten's MacTung deposit (176 km north of Cantung Mine), acquired in 1986 from its principal shareholder, AMAX Inc., was placed on caretaker status due to the continued decline. Surface exploration work was not done on either of these properties during 1986 and 1987.

There were 2014 claims (78 978 ha) in good standing in the Cordilleran District at the beginning of 1986. By the end of the year, no new claims had been staked, and 55 claims (5174 ha) had lapsed. In 1987, 19 new claims (460 ha) were staked and 688 more claims (17 084 ha) lapsed. Thus, there were 1290 (57 031 ha) claims in good standing at the end of 1987.

Seven reports were submitted documenting representation work for the 1986-87 time period ($38,468.35 in 1986 and $118,398.57 in 1987). Also summarized are: one report on 1985 work which was submitted after the 1984-85 Mineral Industry Report was written; previously undocumented 1981 and 1982 work on several Coal Licences; and, 1970 work on a vanadium showing. Prospector Eric Schultes excavated 15 cubic yards of overburden, gravel and rock during 1987 on the KE 1 claim in the Caribou River area (95 D/15) while exploring for gold.

The descriptions of properties that follow are listed by metal commodity and geological environment as follows: carbonate-hosted lead-zinc deposits; tungsten associated with skarn deposits; gold; coal; and, vanadium.

CARBONATE HOSTED ZINC-LEAD DEPOSITS

Carbonate-hosted open-spaced zinc-lead deposits in the Mackenzie Platform are in Proterozoic to Upper Devonian strata. The majority of the significant deposits in the Mackenzie Mountains are in dolomites of Lower Cambrian age. The deposits follow the trend of the Lower Paleozoic strata for 362 km along the Mackenzie Fold Belt (Dawson, 1975). Zinc occurs as pale sphalerite, and commonly predominates over lead by about 10:1. Silver and iron content of the deposits is low. Pyrite and pyrobitumen are minor constituents, and gangue minerals include sparry dolomite, calcite, quartz and barite. Secondary zinc-lead minerals, notably smithsonite, are developed in higher ridge-top showings that escaped glaciation (Dawson, 1975).

Numerous deposits show features similar to those of Mississippi Valley-type deposits: simple mineralogy; low precious metal content; limestone or dolostone host rock; shallow depth of formation; and, solution features, such as the

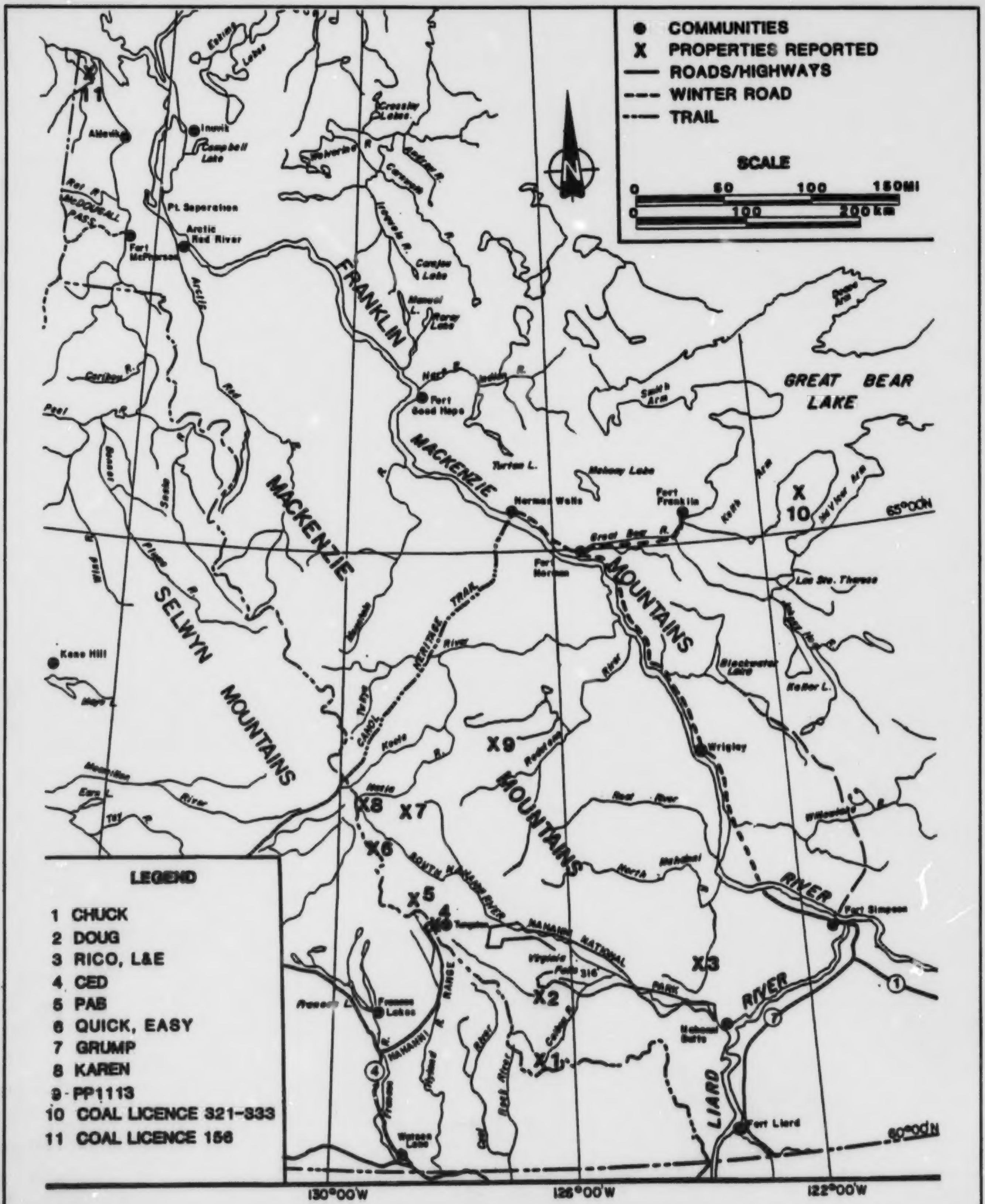

COMMUNITIES
PROPERTIES REPORTED
ROADS/HIGHWAYS
WINTER ROAD
TRAIL
SCALE
0 50 100 150MI
0 100 200km
N
LEGEND
1 CHUCK
2 DOUG
3 RICO, L&E
4 CED
5 PAB
6 QUICK, EASY
7 GRUMP
8 KAREN
9 PP1113
10 COAL LICENCE 321-333
11 COAL LICENCE 156
FRANKLIN
MACKENZIE
MACKENZIE
SELWYN
MOUNTAINS
MOUNTAINS
MOUNTAINS
MACKENZIE RIVER
GREAT BEAR LAKE
LIARD RIVER
Inuvik
Aklavik
Campbell Lake
Pt. Separation
Arctic Red River
Fort McPherson
Fort Good Hope
Norman Wells
Fort Norman
Fort Franklin
Wrigley
Fort Simpson
Nahanni Butte
Fort Liard
Tungsten
Frances Lake
Watson Lake
Keno Hill
Colville Lake
Smith Arm
Great Bear R.
Blackwater Lake
Keller L.
Lac Ste. Therese
Redstone
Root River
Willowlake R.
North Nahanni
South Nahanni River
Nahanni National Park
Virginia Falls
Canol Heritage Trail
Keele R.
Mahony Lake
Turton L.
Hare Indian R.
Peel
Bonnet Plume R.
Snake R.
Wind R.
Caribou R.
Rat R.
McDougall Pass
Mayo L.
Macmillan River
Ross R.
Frances L.
Coal River
Beaver River
Hyland R.
Liard
Range
130°00'W
126°00'W
122°00'W
65°00'N
60°00'N
X1
X2
X3
4
X5
X6
X7
X8
X9
X 10
X 11

FIGURE 3-1: Properties explored in the Cordilleran District, 1986-1987.

TABLE 3-1: MINERAL DEPOSITS IN THE NORTHERN CORDILLERA

NTS	DEPOSIT	TYPE	HOST ROCK & AGE	RESERVES	REFERENCE
95 L/10	Coates Lake (Redstone Copper Belt)	Sabkha-type sedimentary stratabound copper	Coates Lake Group; Proterozoic	37 Mt[*1] at 3.9% Cu 11.3 g/t Ag	Jefferson, 1983 Jefferson & Ruelle, 1986 NMI Card
106 F/2, 3,6,7	Snake River (Crest Deposit)	Jasper-hematite iron formation	Rapitan Group (Ekwi Supergroup); Proterozoic	18 Gt at 46% Fe, 0.3% P_2O_5	Yeo, 1986
106 B/15	Gayna River	Carbonate-hosted open-spaced Zn-Pb	Little Dal Group; Proterozoic	50 Mt[*2] at 4.7% Zn, 0.3% Pb	Abercrombie, 1978 Brock, 1976 NMI Card
106 A/3	BEAR-TWIT (Godin Lakes)	Carbonate-hosted Zn-Pb(Ag)	Whittaker Formation; Ordovician	9.07 Mt[*1] at 5.4% Zn, 2.6% Pb	Gabrielse *et al.*, 1973 DIAND assessment report 080594 NMI Card
95 F/10	Cadillac Vein (Prairie Creek)	Ag-Zn-Pb veins in a brecciated fracture zone	Whittaker Formation; Ordovician	2.14 Mt[*3] at 13.5% Zn, 10.9% Pb, 191.32 g/t Ag, 0.52% Cu, 0.087% Cd	Morrow & Cook, 1987 Northern Miner, 1982
105 I/6	Howards Pass (Summit Lake)	Sediment-hosted stratiform Zn-Pb (Ag-barite)	Road River Formation; Ordovician-Silurian	59 Mt[*1] at 5.4% Zn, 2.1% Pb	Brock, 1976 Goodfellow & Jonasson, 1986
105 O/1	Tom (MacMillan Pass)	Sediment-hosted stratiform Zn-Pb (Ag-barite)	Lower Earn Group (Tom East, Tom West Zones); Middle-Upper Devonian	10.8 Mt[*3] at 7.54% Zn, 6.37% Pb, 73.7 g/t Ag	Carne, 1979 Goodfellow & Jonasson, 1986 McClay & Bidwell, 1986
105 O/1	Jason (MacMillan Pass)	Sediment-hosted stratiform Pb-Zn (Ag-barite)	Lower Earn Group; Middle-Upper Devonian	15.5 Mt[*4] at 7.09% Pb, 6.57% Zn, 79.9 g/t Ag	Bailes *et al.*, 1986 Goodfellow & Jonasson, 1986
105 H/16	Cantung	Scheelite-bearing chalcopyrite-pyrrhotite-sphalerite skarn W-Cu(Zn)	Paleozoic limestone (Ore Limestone, Swiss Cheese Limestone) altered by Cretaceous monzonite intrusions	1.4 Mt of 1.20% WO_3 0.97 Mt of 0.66% WO_3	Dick & Hodgson, 1982 NMI Card
105 O/8	MacTung	Scheelite, pyrrhotite and minor chalcopyrite in pyroxene-garnet skarn	Paleozoic limestone (Lower Zone, Upper Zone) altered by Cretaceous quartz monzonite stocks	32 Mt at 0.92% WO_3	Atkinson & Baker, 1986 Dick & Hodgson, 1982 NMI Card
107 B/4	Aklavik Coal Mine (Donna River)	Coal seams	Coal-bearing division (Unit Kwc of GSC map 1517A); Lower Cretaceous	Sub-bituminous A (12 240 BTU)	Jeletzky, 1975, 1959 Long, 1986, NMI Card Norris, 1981
117 A/9	Coal Mine Lake	Coal seams	Reindeer Formation (Aklak Member); Tertiary	517 Mt of Bituminous C to Sub-bituminous A	Long, 1986 NMI Card

[*1] drill indicated
[*2] possible
[*3] proven, probable and possible
[*4] inferred, indicated

Gayna River deposits, are confined to margins of algal 'patch reefs' within the Proterozoic Little Dal Group (Brock, 1976), a stromatolitic and algal laminated dolomite separated by thick developments of massive, vuggy, recrystallized dolomite (Abercrombie, 1978). The carbonate reefs are bounded by gypsum evaporites and shales of shallow water origin (Brock, 1976). The Gayna River deposits are estimated to contain in excess of 50 Mt of ore grading 4.7% Zn and 0.3% Pb (National Mineral Inventory Card File).

Many deposits in the Mackenzie Platform, however, are high-grade low-tonnage Cretaceous to Tertiary silver-zinc-lead veins which suggests that many of the showings termed Mississippi Valley-type are in fact tectonically related to one or more of the orogenies affecting these rocks (Lord, 1984). The Cadillac Vein (Prairie Creek) deposit, hosted by Ordovician Whittaker and Silurian Road River formations, is estimated to contain 1.45 Mt grading 12:17% Zn, 11.16% Pb, 185.14 g/t Ag, 0.44% Cu and 0.087% Cd (Northern Miner, 1982).

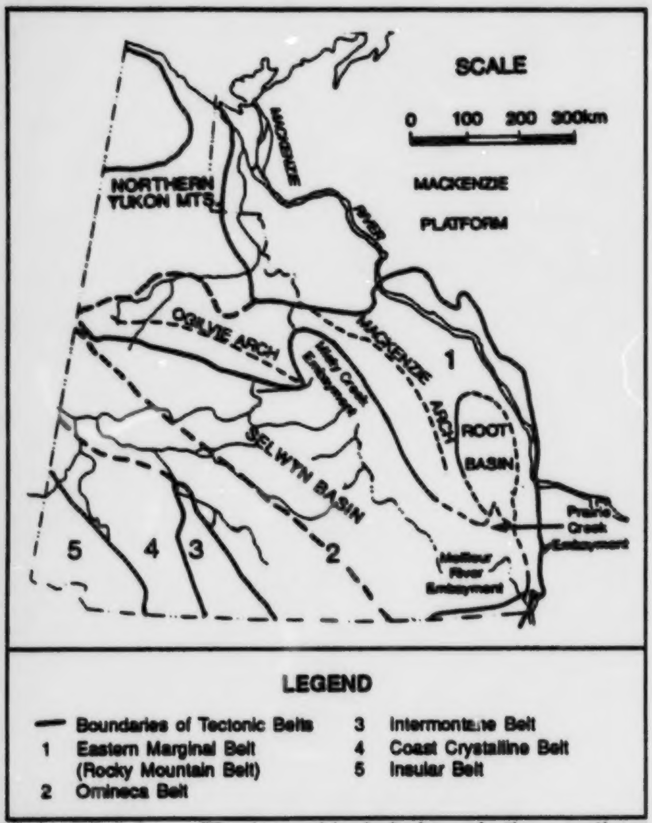


FIGURE 3-2: *Physiographical belts of the northern Cordillera (adapted from Monger et al., 1972).*

RICO, L&E CLAIMS

Procan Exploration
Company Limited
1400, 727 7th Ave SW
Calgary, Alta., T2P 0Z5

Lead, Zinc
95 F/10
61°35'N, 124°47'W

REFERENCES

Morrow (1984); Morrow and Cook (1987).
DIAND assessment report: 082302.

PROPERTY

RICO (186.16 ha) and L&E 1 (84.98 ha).

LOCATION

The claims are 180 km west of Fort Simpson, just north of Nahanni National Park (Fig. 3-1).

HISTORY

A mineralized quartz-calcite vein was discovered about 6 km north-northeast of Prairie Creek Minesite during construction of a winter road in 1980.

RICO, staked to cover this vein, was recorded July 21, 1980. L&E 1 was recorded August 24, 1981. A legal survey was conducted in 1982. The claims are in good standing until 1990.

DESCRIPTION

The shelf-edge Prairie Creek Embayment (Fig. 3-2) is a basinal structure in Selwyn Basin (Morrow, 1984). This embayment is an unfilled remnant of Root Basin (Morrow and Cook, 1987). The Cadillac vein system, a small but high-grade silver-lead-zinc deposit (Table 3-1), trends north-northeasterly, parallel to the trend of the Prairie Creek Embayment (DIAND assessment report 082302).

Lower Paleozoic mixed shales and carbonates, transitional between shelf-type carbonates to the east and basinal shales to the west, dip gently to the north. Consequently, the Ordovician Whittaker Formation, the Silurian Road River Formation, and the Silurian-Devonian Cadillac Formation, which host the Cadillac vein system, are not exposed on the property but underlie the Arnica Formation at a shallow depth (DIAND assessment report 082302).

The claim area is underlain by massive medium-grey dolomites with black chert lenses and layers of the Lower Devonian Arnica Formation and thin-bedded, platy, fine-grained medium- to dark-grey shaly limestone, limy shale or limy mudstone, devoid of fossils of the Middle Devonian Funeral Formation (DIAND assessment report 082302).

A regional scale north-northeast-trending anticline, which extends regionally for 25 km parallel to the Gates Thrust Fault, 3.5 km to the west, cuts through the property. Lineaments are developed parallel to the fold axis. The axial plane of the anticline exhibits considerable shearing but little actual displacement. The fold is tighter to the south than to the north. Two small anticlinal folds on the western limb were rotated or thrust faulted (DIAND assessment report 082302).

CURRENT WORK AND RESULTS

A 1900 m baseline was cut in 1986 for geological mapping and geochemical surveying control. Five hundred and ninety soil samples were collected for lead, zinc, silver and copper analysis.

Mapping outlined a large open anticlinal fold and small scale drag folds associated with regional thrust faults. There are three distinct phases of faulting in the area:

Phase 1 structures are dominantly north-northeasterly trending and are roughly parallel to the Gates Thrust Fault and to the anticlinal axis. On the RICO claim, a fault with this orientation separates the Arnica and Funeral formations;

Phase 2 structures are northwesterly and north-northwesterly trending faults which are probably related to Phase 1 (tensional features); and,

Phase 3 structures are westerly to west-northwesterly trending.

Minerals in the matrix of brecciated and stockworked Arnica Formation dolomite include: smithsonite, minor galena, and an occasional trace of malachite/azurite. They are found in areas proximal to north-northeasterly faults.

There are two showing types. One consists of massive, high-grade veins ranging in thickness from 0.3 to 1.7 m. Sulphides consist of galena, sphalerite and tetrahedrite with minor pyrite. Oxidation products include: smithsonite, malachite/azurite, and minor cerussite. The Winter Road vein, for example, which strikes north-northeasterly, is likely associated with Phase 1 fault structures, lies within 200 m of the axial plane of the anticline, contains quartz/calcite gangue, and cross-cuts the Arnica Formation dolomites. The other showing type consists of galena or traces of tetrahedrite or both, with smithsonite and occasionally malachite/azurite disseminated in a matrix of quartz and minor calcite cement in breccias of the Arnica Formation.

Soil geochemistry outlined several lead, zinc, silver and copper anomalies. Five of these are along and downslope from a fault, and several correlate with mineral showings. A strong anomaly was delineated near the Arnica/Funeral contact at the south end of the claim block.

The geochemical analyses for the Winter Road showing were generally low.

PROSPECTING PERMIT 1113

Equinox Resources Limited	Gallium, Germanium
900, 625 Howe St.	Lead, Zinc
Vancouver, B.C., V6C 2T6	95 M/7
	63°15'N, 126°45'W

REFERENCES

Douglas and Norris (1961); Gabrielse (1967); Gabrielse *et al.* (1973, 1985).

DIAND assessment report: 082525.

PROPERTY

Prospecting Permit 1113 (17 402.1 ha).

LOCATION

The permit area is in the Redstone Mountains, 100 km east of Godlin Lakes and 210 km south of Norman Wells. The closest community is Wrigley on the Mackenzie River, 160 km to the east (Fig. 3-1).

HISTORY

Exploration in the Redstone Mountains during the mid-1970's by Cominco, Welcome North Mines Ltd. and individual prospectors delineated several showings such as the CAP, ADYJO, BOOM, and BLANCHE showings (Fig. 3-3). In 1976 Cominco drilled thirteen holes on the CAP property to test a small stratabound replacement-type zinc-lead deposit. The indicated grades of the showing were 15-20% Zn.

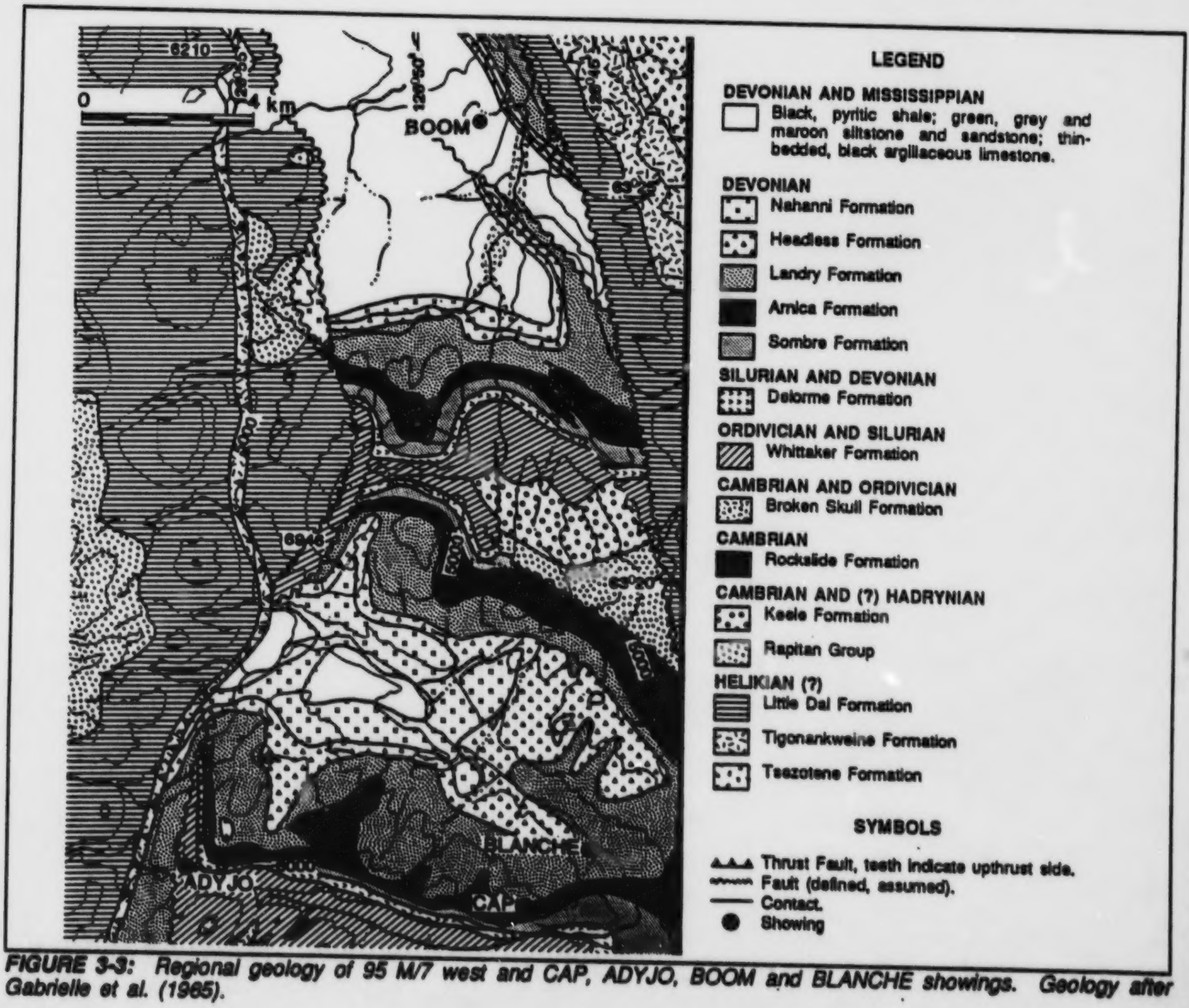

6210
0
4 km
126°50'
BOOM
126°45'
63°25'
6946
63°20'
BLANCHE
ADYJO
CAP
LEGEND
DEVONIAN AND MISSISSIPPIAN
Black, pyritic shale; green, grey and maroon siltstone and sandstone; thin-bedded, black argillaceous limestone.
DEVONIAN
Nahanni Formation
Headless Formation
Landry Formation
Arnica Formation
Sombre Formation
SILURIAN AND DEVONIAN
Delorme Formation
ORDIVICIAN AND SILURIAN
Whittaker Formation
CAMBRIAN AND ORDIVICIAN
Broken Skull Formation
CAMBRIAN
Rockslide Formation
CAMBRIAN AND (?) HADRYNIAN
Keele Formation
Rapitan Group
HELIKIAN (?)
Little Dal Formation
Tigonankweine Formation
Tsezotene Formation
SYMBOLS
Thrust Fault, teeth indicate upthrust side.
Fault (defined, assumed).
Contact.
Showing

FIGURE 3-3: Regional geology of 95 M/7 west and CAP, ADYJO, BOOM and BLANCHE showings. Geology after Gabrielle et al. (1985).

Analyses of sphalerite found previously on these properties indicate possible economic concentrations of gallium and germanium. The area of interest (lead-zinc-gallium-germanium showings) was secured through a Prospecting Permit by Equinox Resources Limited in 1987. By agreement, Equinox has assigned a right to 50% of its interest to Vortex Resources Limited.

DESCRIPTION

The permit area is within the Redstone Arch (Gabrielse *et al.*, 1973), a sequence of folded and faulted Cambrian to Devonian carbonate rocks (Gabrielse *et al.*, 1965; Gabrielse, 1967). Facies changes involving carbonates and argillaceous carbonates and shales, and considerable variations in thickness are typical of the Devonian strata (Gabrielse, 1967).

Paleozoic strata on the eastern flank of the Redstone Arch are broadly folded. The CAP, BOOM and BLANCHE showings are on the gently dipping southwest limb of these synclines. Locally, folds and thrust faults end abruptly against northeast-trending faults along which transcurrent movement may have taken place (Douglas and Norris, 1961).

Numerous zinc-lead showings are: fillings in karst caverns and stratabound replacements within zones of coarse carbonate recrystallization; and, in the carbonates between the Middle Devonian Landry Formation micritic limestone and the Arnica Formation dolomite. Pod-like deposits and steeply dipping fracture fillings of reddish sphalerite and very coarse crystalline galena are associated with dolomite, quartz, smithsonite and pyrobitumen.

The CAP showing is in a zone of recrystallization, replacement and brecciation in the basal beds of the Landry Formation. Sphalerite and galena are found in, and surrounding, a solution collapse breccia zone. The breccia contains randomly-oriented angular limestone blocks up to 2 m in size. Coarse sparry dolomite is found between the fragments. Sphalerite may be within the dolomite, along the margins of the breccia fragments, associated with dolomite veining, or, as small replacement pods in fresh limestone.

CURRENT WORK AND RESULTS

Various zinc showings were examined and systematically sampled to assess their tonnage potential in 1987. Nine representative rock samples were collected from showings to assess the gallium and germanium potential of the sphalerite. Average assays were 0.019% Ga and 0.077% Ge. Concentrations of over 200 ppm (0.02%) Ge in a zinc concentrate is considered to be of economic interest.

TUNGSTEN, ASSOCIATED WITH SKARN DEPOSITS

Tungsten-bearing skarns are associated with an arcuate belt of mid-Cretaceous quartz monzonite and granodiorite intrusions (Dawson and Dick, 1978), the Selwyn Plutonic Suite (Anderson, 1983). These intrusions are along the hinge between predominantly clastic rocks of the Selwyn Basin and equivalent-aged carbonates of the Mackenzie Platform, and define a major tungsten district which includes the Cantung and MacTung deposits (Table 3-1) containing the largest reserves of tungsten in the western world.

The Cretaceous intrusions were emplaced into relatively unmetamorphosed rocks and contact metamorphic aureoles are well developed around them (Dick and Hodgson, 1982). The skarns are coarse-grained calcium-iron-magnesium silicates formed by replacement of carbonate-bearing rocks.

Chalcopyrite and pyrrhotite are associated with the skarns. The W:Cu ratios range from 6:1 to 7:1 and tungsten content increases with pyrrhotite content (Dawson and Dick, 1978). Skarn, hornfels and intrusive rocks may be cut by scheelite-bearing veins of quartz, quartz-tourmaline, and quartz-calc-silicates. Small quartz-molybdenite veins cut skarn and pelitic hornfels or occupy greisened zones in adjacent intrusive rocks (Dawson and Dick, 1978).

CED CLAIMS

Canada Tungsten Mining Corporation Limited	Tungsten 105 H/16
P.O. Box 12525	61°57'31"N,
1600 - 1066 W. Hastings St.	128°16'10"W
Vancouver, B.C., V6E 3X1	

REFERENCES

Brophy (1987); Canada Tungsten Mining Corporation Annual Report 1984, 1985; Cummings and Bruce (1977); Dawson and Dick (1978); Dick and Hodgson (1982); Zaw (1976).

DIAND assessment report: 082137.

PROPERTY

Mining Lease 3129 (CED 41, Lot 1, Group 907), part of the Cantung Mine property.

LOCATION

Tungsten and Cantung Mine (Fig. 3-1) are within the lease area. Tungsten is serviced by a 306 km all-weather road from Watson Lake, 209 km to the south. A 1219 m gravel airstrip at the minesite accommodates STOL (short take-off and landing) aircraft.

HISTORY

The CED claim was staked in 1958 by Seymour Evenson, who then transferred the claim to K.J. Springer. Springer transferred the claim to Canada Tungsten Mining Corporation in 1959. The claim was taken to lease in 1963. The lease was renewed in 1984 for 21 years, and it is in good standing until November 15, 2004.

Underground drilling at Cantung, 213 m west of the previously defined orebody intersected grades of 1.92% WO_3 in 1984. Underground development included 1250 m of drifting and 244 m of raising. A million dollar surface exploration program of sampling, mapping, surveying, and drilling of 914 m was conducted on Lot 1 (Annual Report, 1984).

Underground exploration west of the orebody continued in 1985. In the exploration drift, good grades were found but a fault zone with relatively high water flow was encountered. A parallel exploration drift was driven through the fault zone (Annual Report, 1985). No surface work was done in 1986.

DESCRIPTION

The main regional structure in the Cantung area is a northwest-trending syncline cored by Cambrian limestone, flanked by Cambrian or earlier phyllite and intruded by Cretaceous quartz monzonite stocks. At Cantung, the 'Mine Stock' altered some of the limestone to ore-bearing skarn (Brophy, 1987).

The lease area is underlain by the Proterozoic sediments of the Lower "Phyllite unit" and the Lower Cambrian Sekwi Formation, which includes both clastic and carbonate beds. At Cantung, scheelite-bearing skarns are in two distinct lithological units in the Sekwi Formation: the Ore Limestone, a coarsely crystallized massive Lower Cambrian marble relatively free of impurities, which contains the bulk of the ore-bearing skarn (estimated reserves are 1.4 Mt of 1.20% WO_3); and the Swiss Cheese Limestone (estimated reserves are 0.97 Mt of 0.66% WO_3), with calcareous pods and thin discontinuous beds enclosed in an noncalcareous pelitic matrix, which unconformably underlies the Ore Limestone (Dick and Hodgson, 1982). The open pit orebody, on the upper limb of an overturned anticline (Cummings and Bruce, 1977) is mainly a garnet-pyroxene skarn with disseminated pyrrhotite-scheelite-chalcopyrite and many quartz-biotite veins (Dawson and Dick, 1978). The Ore Limestone plus the overlying and laterally equivalent dolomite are overlain by argillite. Overlying these rocks is a variable sequence of siltstone and dolostone including a prominent pink weathering dolomite (DIAND assessment report 082137).

The structurally controlled 'E-Zone' orebody, on the lower limb of the overturned anticline (Cummings and Bruce, 1977), is a garnet-pyroxene massive pyrrhotite skarn that gives way locally to biotite-amphibole (actinolite/tremolite) skarn (Dawson and Dick, 1978; Zaw, 1976).

CURRENT WORK AND RESULTS

Three AQ-size holes, totalling 282.2 m, were drilled from the parallel exploration drift in 1986 to intersect extensions of the E-Zone deposit. Samples were assayed for WO_3 whenever scheelite was detected using short wave UV light. Assay results included 2.3 m of 3.84% WO_3. The drill holes intersected argillites, cherts, limestones, quartz monzonites, and various assemblages of skarn minerals.

QUICK AND EASY CLAIMS

Hudson Bay Exploration and
Development Company Limited
P.O. Toronto Dominion Centre
Toronto, Ont., M5K 1B6

Tungsten
105 I/11
62°39'N, 129°16'W

REFERENCES

Brophy (1987); Goodfellow (1982).
DIAND assessment reports: 080323, 081780, 082099.

PROPERTY

QUICK (418 ha) and EASY (263 ha).

LOCATION

The claims are 90 km north-northeast of Tungsten (Fig. 3-1). The Howards Pass deposit is 18 km to the south and Macmillan Pass is 75 km to the northwest. Access to the property is by helicopter. The claims are adjoined and partly enveloped by Canamax's NUG claims (Fig. 3-4).

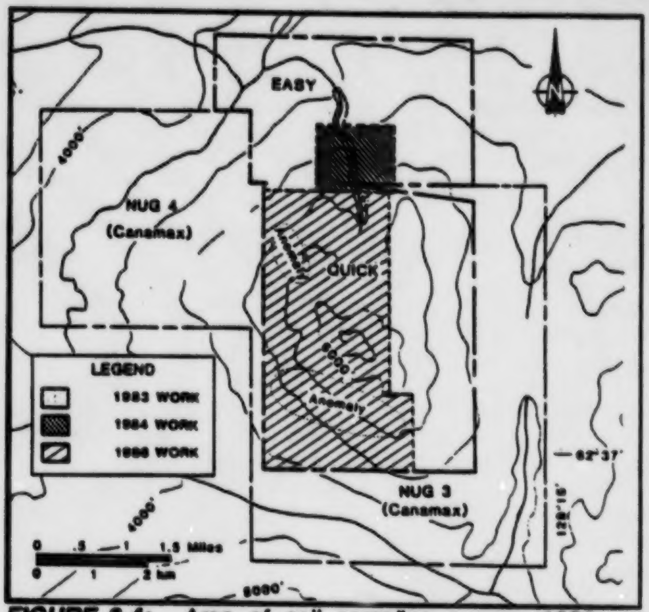


FIGURE 3-4: Area of soil sampling survey, 1986, on QUICK and EASY claims (from DIAND assessment report 082099).

HISTORY

On August 13, 1982, the Geological Survey of Canada (GSC) released the results of a geochemical silt sampling program covering the Nahanni map area (Goodfellow, 1982). QUICK was staked that same day to cover a 60 ppm tungsten anomaly detected by the GSC survey. EASY was added on the north side of QUICK the following year. The claims cover part of an area that was staked and explored for lead and zinc in the early seventies by Cowal Resources Ltd. (ROD claims; DIAND assessment report 080323).

In 1984, following encouraging 1983 panning, a twenty person-day program of panning, soil sampling and magnetic surveying was conducted (Brophy, 1987). Results of the analyses are: trace to 1.4 ppm Ag; 4 to 42 ppm Cu; and, 2 to 38 ppm W (DIAND assessment report 081780).

DESCRIPTION

The claim area, near the eastern margin of the Selwyn Basin, is underlain by Devonian to Mississippian Earn Group sand-banded argillites, argillaceous sandstone and chert pebble conglomerates. Quartz veins are common, particularly in the siliceous argillite and sandstone. There is a concentration of these veins, containing scheelite, in the southwest corner of the QUICK claim. The veins often have phyllic altered borders, and hornfels facies metamorphism is evident in some areas. This metamorphic overprint may be due to a buried intrusive which could also provide a source for the quartz-scheelite veins. At the north end of the claim block, the sparse outcrop of black argillaceous shales may be part of the Ordovician Road River Formation, which regionally underlies the Lower Earn Group (DIAND assessment report 082099).

CURRENT WORK AND RESULTS

Two hundred and forty soil or talus samples were collected in 1986, principally from the central and western portions of the QUICK claim and from one line along the property boundary. Samples were collected at 50 m intervals on lines 300 m apart.

All samples were analyzed for tungsten, copper, tin, and molybdenum; 44 samples were analyzed for gold and silver as well.

One hundred and ten 10 kg samples were collected from talus fines at 100 m intervals along section lines for panning. The samples were panned to 15 mL concentrates. Several samples contained thousands of scheelite grains, including some grains greater than 3 mm in diameter.

Grain counts of scheelite showed a strong correlation to geochemical results. Two strong linear trends outlined by the tungsten, copper, tin and molybdenum analyses and the anomaly delineated by tungsten, copper and gold-silver analyses coincided with higher scheelite grain counts.

Several multi-element targets were outlined in the quartz-scheelite veins in the lower Earn Group sand-banded argillites, sandstones and chert pebble conglomerates, and it is possible that tungsten skarn deposits could exist at depth in underlying Cambrian carbonates.

GOLD

Gold was explored for in various geological environments including auriferous quartz veins in the Lower Cambrian Sekwi Formation volcanics, auriferous skarns adjacent to Cretaceous intrusions, and placers in the tributaries of the Flat River.

CHUCK CLAIM

Serem (Quebec) Inc.	Gold
1110 4ième Ave.	95 D/15
Val D'or, Que., J9P 1JB	60°58'N, 126°34'W

REFERENCES

Gabrielse *et al.* (1973).
DIAND assessment reports: 081665, 082082.

PROPERTY

CHUCK 1 (1004 ha).

LOCATION

The claim is in the Caribou River area, 670 km west-southwest of Yellowknife (Fig. 3-1). Access to the property is by helicopter from Fort Liard, 190 km to the southeast.

HISTORY

The claim was staked in September, 1981 by Serem (Quebec) Inc., to protect gold anomalies detected in a regional heavy-mineral sampling survey in 1980 and from a more detailed follow-up silt sampling, prospecting and mapping survey in June of 1981.

Work in late September, 1981 consisted of mapping, soil sampling, rock geochemical sampling and silt sampling. Five silt samples, from the vicinity of the main creek on the claim, contained anomalous gold ranging from 1600 to 6600 ppb, and one pan concentrate sample assayed 15 000 ppb Au. Subsequent soil sampling in this area outlined arsenic anomalies exceeding 100 ppm. Float in the vicinity of the anomalies is mainly angular volcanic rocks of the Sekwi Formation. Samples of float containing quartz vein material with significant limonite boxwork returned assays up to 50 ppb Au and 212 ppm As.

DESCRIPTION

The CHUCK 1 claim is underlain by Lower Cambrian Sekwi Formation dark-green vesicular andesites and basalts interbedded with light-grey to green limey tuff, coarse grey-green volcaniclastic breccia and agglomerate, and medium-grey fine-grained andesitic rocks. Chlorite-epidote alteration is common in the andesites, which in some areas are intensely silicified and sericitised. Limonite, jarosite and hematite are found in these silicified areas. A distinct unit of orange-brown sandstone and sandy dolomite marks the top of the Sekwi Formation.

The Sekwi Formation is overlain by the medium-grey, wavy-banded limestones of the Upper Cambrian Rabbitkettle Formation (Gabrielse *et al.*, 1973). The rocks are folded into a southward-plunging open anticline known as the Caribou Anticline. There is only about 10% outcrop exposure on the property.

Economic minerals are restricted to the Lower Cambrian Sekwi volcanics and include bornite, malachite and chalcopyrite with associated pyrite, pyrrhotite and magnetite. The sulphides are present as disseminations, fracture fillings, fine stringers and fillings in amygdules. Some encouraging assays, 130 to 1500 ppb Au, were obtained from outcrop samples. Narrow, 4-10 cm, east-trending quartz veins, averaging 5 ppb Au and up to 18 ppm As, have been found along gullies and ridges.

CURRENT WORK AND RESULTS

Ten days were spent mapping and prospecting in 1986, to locate the source of gold and arsenic geochemical anomalies outlined by silt and soil samples. Pyrite- and arsenopyrite-bearing quartz veins are thought to be the source of the anomalies.

DOUG CLAIM

A. Black and D. Schellenberg	Gold
Watson Lake, Yukon, Y0A 1C0	95 E/8
	61°20'N, 126°28'W

REFERENCES

DIAND assessment reports: 080393, 080487, 082614.

PROPERTY

DOUG 1 (167.2 ha).

LOCATION

The claim is 190 km northeast from Watson Lake and 4.5 km west-northwest of MacMillan Lake (Fig. 3-1). It is on Moose Creek, a tributary of McLeod Creek which drains into the Flat River.

HISTORY

In the 1970's alluvial gold was found at the bottom of gravels in tributaries of creeks and in creeks that flowed into the Flat River. Nahanni Placers, in 1974, staked the WINDFALL (Bennett Creek), BINKER (McLeod Creek) and EPLER (Grizzly Creek) claim groups and explored them for placers by digging test pits and panning the material excavated. Pan and portable sluice box equipment were used to explore the claims in 1975. Only traces of gold were found. Lloyd Tyerman excavated a pit 4.9 m (16 ft) to the bedrock using a small suction dredge on the BINKER claims during the 1970's. These claims lapsed in 1978.

The DOUG claim was recorded September 12, 1985 by Doug Schellenberg and Alex Black. Alex Black excavated two test pits in 1985. The pits contained grey-blue clay with pyrite and black sand at 1 m depth (DIAND assessment report 082614).

DESCRIPTION

The claim is underlain by: interbedded shales; siltstones, which are in part calcareous; and, carbonates of the Sunblood Formation and the Road River Formation (Middle Ordovician to Lower Devonian). The sedimentary rocks are intruded by rusty weathering Cretaceous granodiorites (DIAND assessment report 082614) which domed and folded the sedimentary rocks into complementary anticlines and synclines (DIAND assessment report 080393).

At least 2.7 billion m^3 of material have been removed and transported eastward into McLeod Creek and then to Flat River (DIAND assessment report 080393). The gravels in the area are permeable, containing cobble- to boulder-sized rocks, and the creek has a high flow rate in the summer (DIAND assessment report 082614).

CURRENT WORK AND RESULTS

Exploration, in 1986, for the bedrock source of the alluvial gold consisted of re-cutting the trail from MacMillan Lake to the claims, mapping between the canyon of Moose Creek and the cabin and further up the valley (Fig. 3-5), and magnetic surveying. Mapping of black slates and carbonates revealed a northwest-striking, steeply west-dipping cleavage, indicating beds may be overturned (if the foliation in the carbonates is bedding). The slate contained under 1% sulphides as euhedral pyrite cubes up to 8 mm in size. Pyrite zones, up to 10 m thick, were delineated. Impure carbonates, to the west, were exposed and the transition from silty limestone to slate appeared gradational over a stratigraphic thickness of 200 m.

Two very irregular quartz veins, 0.5 m thick, were found in the canyon. The friable nature of the rock prevented access for sampling.

A bluish clay, at the bottom of the pits, contained pyrite and other heavy minerals (iron-titanium minerals) which were visible when panned. This clay might represent a fault zone. No visible gold was found in this material from panning, and no appreciable amount of gold was found from assaying.

An abrupt change in the magnetic field may indicate a change in the lithology. Bedrock is not exposed so either a normal or faulted contact is possible.

A bedrock source for the gold was not found. Alluvial gold may be at the rock surface; however, the tonnage of gravel at this locality may be limited.

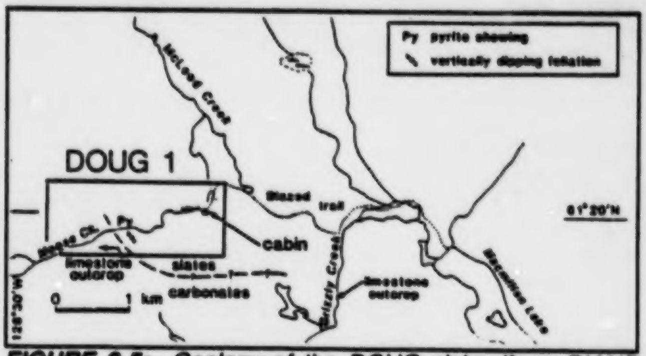


FIGURE 3-5: Geology of the DOUG claim (from DIAND assessment report 082614).

GRUMP CLAIM

Giant Yellowknife Mines Limited
Bag 3000
Yellowknife, NWT, XIA 2M2

Gold, Silver, Lead
105 I/15
62°56'15"N,
128°42'30"W

REFERENCES

Green *et al.* (1968); Gordey (1980, 1981).
DIAND assessment reports: 081108, 081914, 082362.

PROPERTY

GRUMP (523 ha).

LOCATION

The GRUMP claim is 16 km southeast of O'Grady Lake and 75 km east-southeast of MacMillan Pass on the NWT-Yukon border (Fig. 3-1). Access is by helicopter.

HISTORY

Auriferous massive sulphide-bearing boulders were discovered by Welcome North Mines Limited in 1979. They staked the area as the MASS claim. Grab samples assayed up to 11.4% Pb, 128.2 g/t Ag and 22.8 g/t Au. Welcome North Mines optioned the property to Riocanex Incorporated. Riocanex Inc. conducted VLF EM and vertical loop EM surveying, soil sampling, trenching and prospecting on the property in 1980, but were unable to find the source of the massive sulphide boulders. The claims lapsed in June, 1983.

Covello and Associates staked the GRUMP claim on June 6, 1983 and then transferred the property to Giant Yellowknife Mines on October 24, 1984. That year, Giant Yellowknife Mines conducted magnetic, gravity, VLF EM and geological surveys (DIAND assessment report 081914). Coincident magnetic, gravity and VLF EM anomalies over the baseline and auriferous boulders were outlined.

Grab samples of pyrrhotite-rich carbonates, assayed for copper, zinc, gold, silver, lead and arsenic, contained nil to trace concentrations of all metals, except for one sample which assayed 0.51 g/t Au. Grab samples of massive sulphide float assayed between 8.23 to 29.49 g/t Au (average 18.6 g/t), 7.54 to 147.43 g/t Ag (average 61.4 g/t), and 16 to 37% As (average 29%). Three lead assays ranged from 6% to 14%, but all zinc and copper assays were less than 1% (DIAND assessment report 081914).

The auriferous boulders are probably from a vein or system of veins comprising a small to large portion of the anomaly.

DESCRIPTION

The regional geology of the Nahanni map area is shown by Green *et al.* (1968) and Gordey (1980, 1981).

Grey-weathering, well-layered dolomite and limestone, possibly Lower Paleozoic sediments of the Road River Formation (DIAND assessment report 081108), are intruded by monzonite that forms a peripheral phase of the Cretaceous O'Grady Batholith (to the south). The main showing, disseminated pyrrhotite (up to 50%), minor chalcopyrite and sphalerite skarn developed within the irregular 50 m wide contact aureole around a monzonite. Also, there are numerous small boulders of massive arsenopyrite-galena-pyrite-chalcopyrite-sphalerite, probably derived from the trench excavated by Riocanex (DIAND assessment report 082362).

CURRENT WORK AND RESULTS

Exploration, in 1986, consisted of: drilling 4 holes totalling 250 m, to test geophysical anomalies with coincident auriferous sulphide-bearing boulders; sluicing; and, prospecting.

Prospecting determined that the sulphide boulders were locally derived but were not representative of the geophysically anomalous bedrock lithology immediately beneath them; drilling showed that the geophysical conductors are disseminated to banded sulphide-rich (pyrrhotite) silty carbonates adjacent to a large granodioritic intrusive; and, drill core assays were up to 0.867 g/t Au.

KAREN CLAIM

Clifton Star Resources Ltd.
1110, 625 Howe St.
Vancouver, B.C., V6C 2T6

Gold, Silver, Lead,
Zinc, Stibnite,
Tungsten, Tin, Arsenic
105 I/15
62°59'N, 128°40'W

REFERENCES

Anderson (1983); Gordey (1980).
DIAND assessment reports: 062199, 080501, 082039.

PROPERTY

KAREN 1 (334.44 ha).

LOCATION

The claim is 19 km east of O'Grady Lake and near the headwaters of the south Nahanni River (Fig. 3-1).

HISTORY

The original KAREN group (KAREN 1-107) was staked in 1974 to cover gossans found during prospecting and exploration by Canada Tungsten Mining Corp. Canada Tungsten, in 1975, conducted reconnaissance prospecting, mapping, trenching and sampling. Assays from the "main showing" ranged from 0.103 to 1.120 g/t Au and 0.34 to 49.7 g/t Ag. Numerous skarn zones were found and sampled. Galena, sphalerite, stibnite and cassiterite were present in anomalous amounts, but the showings were considered to be too small and low grade to be of economic interest. The claims lapsed in February, 1981.

The area was restaked as KAREN 1 by J.C. Turner in March 4, 1981. Turner transferred the claims to W.R. Michaluk on June 30, 1981, who in turn transferred them to Houstonian Resources Inc. (now Clifton Star Resources Inc.) on September 14, 1981.

DESCRIPTION

The claim area is underlain by sedimentary rocks, ranging in age from Late Proterozoic to Devono-Mississippian, that change facies rapidly across generally northwest-trending hinge lines (Gordey, 1980). Massive, but locally well-bedded, finely-crystalline, grey to dark-grey limestone outcrops in the claim area (DIAND assessment report 082039). The limestone contains Heliophyllium corals which indicate Devonian age. Beds of quartzite, siltstone and chert, exposed mainly in felsenmeer, were noted locally.

The sediments are intruded to the south and east of the claim area by the O'Grady Batholith (Fig. 3-6; DIAND assessment report 082039), part of the northeastern belt of the Selwyn Plutonic Suite comprising hornblende granite and hornblende granodiorite (Anderson, 1983). Tourmaline-bearing calcsilicate hornfels are found as far as 1 km north of the northern margin of the batholith. Tourmaline-bearing, rarely miarolitic, aplite and granite pegmatite dykes are widespread, especially in the immediate country rocks (Anderson, 1983).

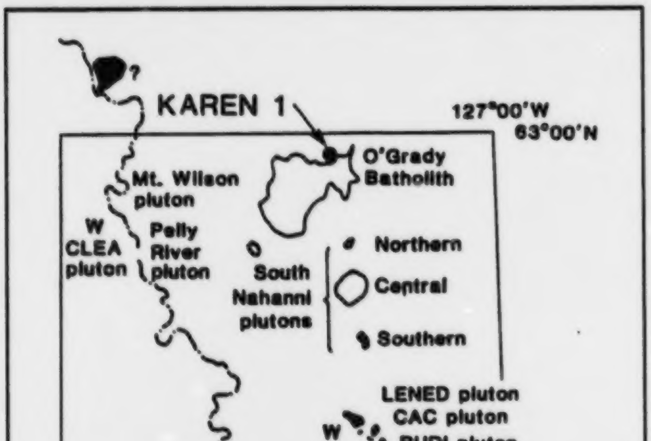

KAREN 1
127°00'W
63°00'N
O'Grady Batholith
Mt. Wilson pluton
W
CLEA pluton
Pelly River pluton
South Nahanni plutons
Northern
Central
Southern
LENED pluton
CAC pluton
RUDI pluton
W
Mt. Appler pluton
?
Flat Lake pluton
NAHANNI (105 I)
W
62°00'N
Tungsten
130°00'W
128°30'W
SYMBOLS
Hornblende (biotite) – bearing plutons
Hornblende–absent, biotite–bearing plutons
? Uncertain assignment of pluton
W Tungsten–bearing skarns
0 10 20 30 40 50 km

FIGURE 3-6: KAREN claim and various plutons in the Cordillera (adapted from DIAND assessment report 082039).

Altered carbonates of Ordovician, Silurian and Devonian age contain pods and lenses (2 m by 10 m) of sulphide-bearing (pyrite-pyrrhotite) skarn with anomalous concentrations of lead, zinc, antimony, tin, silver and gold. These skarns are interpreted as contact metamorphic and fault-controlled deposits (DIAND assessment report 082039).

CURRENT WORK AND RESULTS

Exploration consisted of mapping, prospecting, and sampling during 1985. Three types of mineral showings have been found in the claim area:

1. pyrite-stibnite-sphalerite-arsenopyrite in shear zones (main showing);
2. skarns adjacent to intrusive contacts; and,
3. disseminated pyrite and pyrrhotite in intrusive rocks.

The main showing is a gossan formed at the intersection of several shear zones. Nearby a porphyritic, quartz monzonite dyke may have been emplaced along a similar structure. Skarn minerals have been traced along the northern margin of a porphyritic quartz monzonite dyke which cuts across the central part of the claim area. The skarn is garnet, vesuvianite, wollastonite and calcite with minor disseminated pyrite and pyrrhotite.

Assay results of rock sampling included: 6.58% Pb, 1.70% Zn, 4.06% As, and 4.20% Sb over 0.7 m on the main showing; 45 ppm W from two skarn samples; and, 22 ppm Sn, also obtained from a skarn sample. Elsewhere, the skarns are only weakly mineralized with sulphides, and geochemical sampling revealed only weakly anomalous amounts of tin and tungsten.

COAL

Coal exploration during 1981 and 1982 was in the Cretaceous and Tertiary rocks of the Great Bear Lake and Mackenzie Delta areas.

COAL EXPLORATION LICENCES 321-333

Echo Bay Mines Ltd.	Coal
Exploration Office	96 H/2,3,6,7,8
10354 Granville Sq.	121°00'N, 65°15'W
200 Granville St.	
Vancouver, B.C., V6C 1S4	

REFERENCES

Balkwill (1971).
DIAND assessment report: 062189.

PROPERTY

Coal Exploration Licences 321-333 (210 852 ha).

LOCATION

The thirteen coal exploration licences cover Grizzly Bear Mountain, Great Bear Lake, which is 450 km northwest of Yellowknife (Fig. 3-1). Port Radium is 80 km northeast of the licence area.

HISTORY

The geology of Grizzly Bear Mountain was mapped by the GSC at a scale of 1:500 000 (Balkwill, 1971). A reconnaissance helicopter traverse to find and sample reported coal showings was conducted on August 27, 1981 by Echo Bay Mines. Subsequently it obtained thirteen coal exploration licences on August 31, 1981. The coal exploration licences were relinquished on August 31, 1982.

DESCRIPTION

Grizzly Bear Mountain is underlain by Upper Cretaceous, flat-lying: shale; siltstone; mudstone with thin layers of lignite; and, sandstone with a 1.5 m thick, soft, black coal seam (Balkwill, 1971). There is little outcrop because of a thick cover of glacial drift.

CURRENT WORK AND RESULTS

Four coal showings were found during a helicopter supported reconnaissance traverse in August, 1981; three showings were sampled. The coal is lignite B by rank, but has a high barium content. The extent of the coal and the number of seams could not be determined due to extensive glacial drift cover, but probably underlies all of Grizzly Bear Mountain.

COAL EXPLORATION LICENCE 156

Petro-Canada Resources	Coal
Coal Division	117 A/9
Box 2844	68°41'N, 136°15'W
Calgary, Alta., T2P 3E3	

REFERENCES

Long (1986); Norris (1981); Young (1975).
DIAND assessment reports: 062123, 062162.

PROPERTY

Coal Exploration Licence 156 (25 628 ha).

LOCATION

The Coal Mine Lake property, on the western edge of the Mackenzie Delta, is approximately 110 km northwest of Inuvik (Fig. 3-1). The western edge of the property coincides with the Yukon border.

HISTORY

Coal was discovered in this area by the Inuit. The GSC has mapped intermittently in this region since 1915. Coal was mined, from 1940 to 1956, from a vertical seam at the southwest corner of Coal Mine Lake and barged to Aklavik where it was used as fuel. The mining venture ended when coal could not be mined any further because the seam was displaced by a major fault.

Petro-Canada Exploration Inc. was issued a coal exploration licence in April 1981. Petro-Canada applied for the coal licence because GSC reports described thick coal seams exposed along the banks of Aklak Creek (DIAND assessment report 062162). The coal exploration licence expired April 27, 1984.

DESCRIPTION

The sediments on the property are part of a series of Cenozoic mollassic wedges deposited in the Richards Island Basin. Thick coal seams are in the Aklak Member at the base of the Tertiary Reindeer Formation. The shallow-dipping

Reindeer Formation is bounded by nearly vertical, planar faults (Long, 1986). The Aklak Member includes cobble conglomerates, sandstones, shales and coal seams. The environment of deposition is interpreted as an alluvial plain deposit. Twenty-one coal seams, ranging in thickness from 0.4 to 4.4 m, were delineated in a stratigraphic thickness of 300 m (DIAND assessment reports: 062123, 062162).

The regional structure of the Arctic Coastal Plain is characterized by north- to northeast-trending folds and high angle normal faults. Within the study area, normal faults are inferred along the western margin of the Tertiary deposits. Deformation of the strata is minimal and appears to be restricted to near the fault planes (DIAND assessment reports: 062123, 062162).

CURRENT WORK AND RESULTS

A two-man reconnaissance team visited the area in 1981 to inspect the coal showings. Thick seams of sub-bituminous to high volatile C bituminous coal, containing approximately 30% ash, were verified. An area of approximately 10 km^2 is underlain by gently dipping coal-bearing strata. A deposit of 30 to 50 Mt of sub-bituminous to high volatile C bituminous coal is possible for this area.

In July and August 1982, a three-man crew mapped at 1:5000 scale, excavated 21 trenches, and sampled coal of the Aklak Member of the Reindeer Formation in the vicinity of Coal Mine Lake.

Several hundred million tonnes of high quality thermal coal underlay the property. Inferred geological reserves of over 500 Mt are estimated in the central and eastern portions of the property. The southwestern area, west of Aklak Creek, may contain additional resources. The geologic structure of the area is simple. Gentle bedding dips suggest surface mining potential with average *in situ* strip ratios of less than four bank cubic metres per tonne. The high specific energy values and low ash and sulphur content of this coal indicate its suitability for thermal power generation.

VANADIUM

A vanadium showing in Silurian-Devonian argillites was evaluated in 1971 to determine reserves and operating costs. This work is documented here since it was not reported in previous Mineral Industry Reports.

PAB CLAIMS

Placer Development Limited
1600 Bentall IV
1055 Dunsmuir St.
Vancouver, B.C., V6C 1A8

Vanadium
105 I/1
62°04'30"N,
128°25'W

REFERENCES

DIAND assessment report: 062261.

PROPERTY

PAB 1-27.

LOCATION

The claim is on the western border of the District of Mackenzie, 19 km northwest of Tungsten, and 210 km north of Watson Lake, Y.T. (Fig. 3-1).

HISTORY

Three areas with anomalous metal contents near the Flat River headwaters were delineated by geochemical prospecting during 1966. The PAB, PAT and GAIL claims were staked in 1967 to cover these areas. Argillite samples collected from the PAB claims, by William McIntosh, contained anomalous amounts of vanadium. Samples collected from the PAT and GAIL claims had little economic potential; thus, these claims lapsed.

The New Brunswick Research and Productivity Council (NBRC) studied the mineralogy of the argillites during spring, 1968, to identify the vanadium-bearing mineral. The vanadium-bearing mineral was determined to be a mica, probably roscoelite.

A study investigating the potential for utilizing geophysical exploration techniques was undertaken in mid-July, 1968. Resistivity, SP and EM surveys were carried out, but only SP was able to delineate mineralized rock. A brief and unsuccessful geological reconnaissance and regional geochemical stream sampling program was carried out by D.A. Howard. Howard recommended additional stream sampling, trenching, mapping and diamond drilling be done. The drilling was attempted during 1969, but aborted due to technical difficulties. No core was recovered.

A preliminary metallurgical program to explore the potential for vanadium recovery from the argillites consisted of bench scale tests. Recoveries of 80% were indicated. The most promising process utilized in these tests was an oxidizing roast, salt roast, sulphuric acid leach procedure.

The claims lapsed May 29, 1987.

DESCRIPTION

The PAB claim area is near the western boundary of the Selwyn Basin. Four units of Devonian-aged argillite are exposed on the property.

The argillites overlie the 'Trilobite bearing argillite' which in turn overlies the Lower Cambrian Swiss-Cheese Limestone. The second unit of argillite is a sequence of medium-bedded, compact, black, graphitic argillites and is the principal vanadium-carrying unit on the property. In addition to vanadium minerals, these rocks contain up to several percent very fine-grained pyrite.

Samples of the vanadium-bearing argillite contain greater than 0.4% V_2O_5. The bed is approximately 56.4 m thick in outcrop section and 29.9 m thick in drill hole intersection. The average grades of the two sections are respectively 0.59% and 0.49% V_2O_5.

CURRENT WORK AND RESULTS

The work was done in 1970 but was not reported in previous Mineral Industry Reports.

Five holes were drilled, totalling 321.9 m, to determine the continuity of the vanadium-bearing rocks and to acquire stratigraphic information in areas of limited outcrop. Only one hole intersected rocks with significant vanadium content (average 0.49% V_2O_5). Sections penetrated by the drill holes could not be correlated with either sections measured in outcrop or in other diamond drill holes. The drill holes probably penetrated portions of the stratigraphic section not exposed in outcrop.

Reserves were estimated at 2.72 to 4.54 Mt to a depth of 121.9 m in the block between upper Janice Creek and Jim Creek. Additional reserves are probably available both at greater depth and northeast of Janice Creek.

REFERENCES

Abbot, J.G., S.P. Gordey, and D.J. Tempelman-Kluit, 1986:
Setting of Stratiform, Sediment-hosted Lead-Zinc Deposits in Yukon and Northeastern British Columbia; *in* Mineral Deposits of the Northern Cordillera, CIMM Special Volume 3, p. 1-18.

Abercrombie, H.J., 1975:
Mineralogy and Environment of Deposition of a Precambrian Evaporite Deposit, Mackenzie Mountains, NWT; an unpublished BSc. Thesis, University of British Columbia, Vancouver, B.C., 45 p.

Anderson, R.G., 1982:
Geology of the Mactung pluton in Niddery Lake map area and some plutons in the Nahanni map area, Yukon Territory and District of Mackenzie; *in* Geological Survey of Canada Paper 82-1A, p. 299-304.

Anderson, R.G., 1983:
Selwyn Plutonic Suite and its Relationship to Tungsten Skarn Mineralization, Southeastern Yukon and District of Mackenzie; *in* Geological Survey of Canada Paper 83-1B, p. 151-163.

Atkinson, D. and D.J. Baker, 1986:
Recent Developments in the Geologic Understanding of MacTung; *in* Mineral Deposits of the Northern Cordillera, CIMM Special Volume 3, p. 234-244.

Bailes, R.J., B.W. Smee, D.W. Blackadar and H.D. Gardner, 1986:
Geology of the Jason Lead-Zinc-Silver Deposits, Macmillan Pass, Eastern Yukon; *in* Mineral Deposits of the Northern Cordillera, CIMM Special Volume 3, p. 87-99.

Balkwill, H.R., 1971:
Reconnaissance Geology, Southern Great Bear Plains, District of Mackenzie; Geological Survey of Canada Paper 71-11, 47 p.

Blusson, S.L., 1968:
Geology and tungsten deposits near the headwaters of Flat River, Yukon Territory and southwest District of Mackenzie, Canada; Geological Survey of Canada, Paper 67-22.

Brock, J.S., 1976:
Recent developments in the Selwyn-Mackenzie Zinc-Lead Province Yukon and Northwest Territories; *in* Western Miner, March 1976, p. 9-16.

Brophy, J.A., 1987:
Operating Mines; *in* Mineral Industry Report 1984-85, NWT; INAC-NAP NWT Geology Division, p. 14-42.

Brophy, J.A., 1987:
Cordilleran District; *in* Mineral Industry Report 1984-85, NWT; INAC-NAP NWT Geology Division, p. 43-53.

Brown, A.S., R.J. Cathro, A. Panteleyev and C.S. Ney, 1971:
Metallogeny of the Canadian Cordillera; *in* The Canadian Mining and Metallurgical (CIM) Bulletin, v. 64, no. 709, p. 37-61.

Canada Tungsten Mining Corporation Annual Reports, 1984, 1985.

Carne, R.C., 1979:
Geological Setting and Stratiform Mineralization: Tom Claims, Yukon Territory; INAC-NAP-Yukon Geology Division, EGS 1979-4.

Cecile, M.P., 1982:
The Lower Palaeozoic Misty Creek Embayment, Selwyn Basin, Yukon and NWT; Geological Survey of Canada, Bulletin 335, 78 p.

Cummings, W.W. and D.E. Bruce, 1977:
Canada Tungsten - change to underground mining and description of mine-mill procedures; *in* Canadian Journal of Mining and Metallurgy, v. 70, no. 784, p. 94-101.

Dawson, K.M., 1975:
Carbonate-hosted zinc-lead deposits of the Northern Canadian Cordillera; *in* Current Research, Part A, Geological Survey of Canada, Paper 75-1A, p. 239-241.

Dawson, K.M. and L.A. Dick, 1978:
Regional Metallogeny of the Northern Cordillera: Tungsten and base metal-bearing skarns in southeastern Yukon and southwestern Mackenzie; *in* Current Research, Geological Survey of Canada, Paper 78-1A, p. 287-292.

Dick, L.A. and C.J. Hodgson, 1982:
The MacTung W-Cu (Zn) contact metasomatic and related deposits of the Northwestern Canadian Cordillera; *in* Economic Geology, v. 77, p. 845-867.

Douglas, R.J.W., H. Gabrielse, J.O. Wheeler, D.F. Scott, and H.R. Belyea, 1970:
Geology of Western Canada; *in* Geology and Economic Minerals of Canada; R.J.W. Douglas editor; Geological Survey of Canada, Economic Geology Report No. 1, p. 365-488.

Douglas, R.J.W. and D.K. Norris, 1961:
Camsell Bend and Root River Map areas, District of Northwest Territories; Geological Survey of Canada, Paper 61-13, 36 p.

Gabrielse, H., 1967:
Tectonic evolution of the northern Canadian Cordillera; *in* Canadian Journal of Earth Sciences, v. 4, p. 271-198.

__________, 1980:
Stratigraphic Cross-Section, Selwyn Basin to Mackenzie Platform, Nahanni Map Area, Yukon Territory and District of Mackenzie; *in* Geological Survey of Canada, Paper 80-1, Part A, p. 353-355.

Gabrielse, H., S.L. Blusson, and J.A Roddick, 1973:
Geology of the Flat River, Glacier Lake and Wrigley Lake map area, District of Mackenzie and Yukon Territory; Geological Survey of Canada, Memoir 366.

Gabrielse, H., J.A. Roddick and S.L. Blusson, 1965:
Flat River, Glacier Lake and Wrigley Lake, District of Mackenzie and Yukon Territory; Geological Survey of Canada, Paper 64-52, 30 p.

Goodfellow, W.D., 1982:
Regional stream sediment and water geochemistry of the Nahanni map-area, Yukon and NWT; Geological Survey of Canada, Open File 868.

Goodfellow, W.D. and I.R. Jonasson, 1986:
Environment of Formation of the Howards Pass (XY) Zn-Pb Deposit, Selwyn Basin, Yukon; *in* Mineral Deposits of the Northern Cordillera, CIMM Special Volume 3, p. 51-70.

Gordey, S.P., 1980:
Nahanni map-area, Yukon and NWT; Geological Survey of Canada, Open File 689 (1:125 000).

__________, 1981:
Geology, Nahanni map-area, Yukon and NWT; Geological Survey of Canada, Open File 780 (1:125 000).

Green, L.H., J.A. Roddick, and S.L. Blusson, 1968:
Geology, Nahanni, District of Mackenzie and Yukon Territory; Geological Survey of Canada, Map 8-1967.

Jefferson, C.W., 1983:
The Upper Proterozoic Redstone Copper Belt, Mackenzie Mountains, NWT; unpublished PhD. Thesis, University of Western Ontario, London, Ontario. v. 1, 246 p.

Jefferson, C.W. and J.C.L. Ruelle, 1986:
The Late Proterozoic Redstone Copper Belt, Mackenzie Mountains, Northwest Territories; *in* Mineral Deposits of the Northern Cordillera, CIMM Special Volume 3, p. 154-168.

Jeletzky, J.A., 1959:
Uppermost Jurassic and Cretaceous Rocks, East Flank of Richardson Mountains between Stony Creek and Lower Donna River, Northwest Territories; Geological Survey of Canada, Paper 59-14, 31 p.

__________, 1975:
An Estimate of Right-Lateral Displacement on Donna River Fault, Northwestern District of Mackenzie, NWT; *in* Report of Activities, Geological Survey of Canada, Paper 75-1, Part A, p. 541-543.

King, P.B., 1977:
The Evolution of North America. Princeton University Press, Princeton, New Jersey.

Long, D.G.F., 1986:
Coal in Yukon; *in* Mineral Deposits of the Northern Cordillera, CIMM Special Volume 3, p. 311-318.

Lord, C.C., 1984:
Nahanni region; *in* Mineral Industry Report, 1980/81, NWT; NWT Geology Division, DIAND, p. 409-435.

Lydon, J.W., Goodfellow, W.D. and Jonasson, I.R., 1985:
A general genetic model for stratiform baritic deposits of the Selwyn Basin, Yukon Territory and District of Mackenzie; *in* Geological Survey of Canada Paper 85-1A, p. 651-660.

Macqueen, R.W., 1976:
Sediments, Zinc and Lead, Rocky Mountain Belt, Canadian Cordillera; *in* Geoscience Canada, v. 3, no. 2, p. 71-81.

McClay, K.R. and G.E. Bidwell, 1986:
Geology of Tom Deposit, Macmillan Pass, Yukon; *in* Mineral Deposits of the Northern Cordillera, CIMM Special Volume 3, p. 100-114.

Monger, J.W.H., J.G. Souther, and H. Gabrielse, 1972:
Evolution of the Canadian Cordillera: A plate-tectonic model; *in* American Journal of Science, v. 272, summer, p. 577-602.

Morrow, D.W., 1984:
Sedimentation in Root Basin and Prairie Creek Embayment - Siluro-Devonian, NWT; *in* Bulletin of Canadian Petroleum Geology, v. 32, no. 2 (June), p. 162-189.

Morrow, D.W. and D.G. Cook, 1987:
The Prairie Creek Embayment and Lower Palaeozoic Strata of the Southern Mackenzie Mountains; Geological Survey of Canada, Memoir 412, 195 p.

Murphy, J.D., and W.D. Sinclair, 1974:
Exploration for Lead-Zinc in the Selwyn and Mackenzie Mountains, Yukon and Northwest Territories; a presentation at the Prospectors and Developers Association Conference in Toronto on March 11, 1974.

National Mineral Inventory Card File:
95L/10 Cu 1; 105H/16 W 1; 105O/8 W 1; 106A/3 Zn 1; 106B/15 Zn 3; 107B/4 COL 1; and 117A/9 COL 1.

Norris, D.K., 1981:
Geology, Blow River and Davidson Mountains, Yukon and District of Mackenzie; Geological Survey of Canada, Map 1516A.

__________, 1981:
Geology, Aklavik, District of Mackenzie; Geological Survey of Canada, Map 1517A (1:250 000).

Northern Miner, 1982:
Cadillac plans production to commence next month, by Nicholas Cotter. April 8, 1982, p. 1 & 5.

Padgham, W.A., 1979:
Geology of the Northwest Territories: A Summary; NWT Geology Division, DIAND.

Ricketts, B.D., 1984:
A Coal Index for Yukon and District of Mackenzie, Northwest Territories; Geological Survey of Canada, Open File 1115. 83 p.

Souther, J.G., 1967:
Cordilleran volcanic study; *in* Report of Activities, Part A, Geological Survey of Canada, Paper 67-1, p. 89-92.

Yeo, G.M., 1986:
Iron formation in the Late Proterozoic Rapitan Group, Yukon and Northwest Territories; *in* Mineral Deposits of Northern Cordillera, CIMM Special Volume 3, p. 142-153.

Young, F.G., 1975:
Upper Cretaceous Stratigraphy, Yukon Coastal Plain and Northwestern Mackenzie Delta; Geological Survey of Canada, Bulletin 249, 83 p.

Young, G.M., C.W. Jefferson, G.D. Delaney, and G.M. Yeo, 1979:
Middle and Late Proterozoic evolution of the northern Canadian Cordillera and Shield; *in* Geology, v. 7, p. 125-128.

Zaw, U.K., 1976:
The Cantung E-Zone orebody, Tungsten, NWT: a major scheelite skarn deposit; Unpublished M.Sc. Thesis, Queen's University, Kingston, Ont.

Zaw, U.K. and A.H. Clark, 1978:
Fluoride-hydroxyl ratios of skarn silicates, Cantung E-Zone scheelite orebody, Tungsten, NWT; *in* Canadian Mineralogist., v. 16, p. 207-221.

CHAPTER 4
ARCTIC ISLANDS REGION

Walter A. Gibbins
District Geologist Arctic Islands

INTRODUCTION

The Arctic Islands Region corresponds to the District of Franklin; it includes the Arctic Islands and Melville Peninsula.

The Arctic Archipelago includes all or parts of several major geological provinces. To the south and east it is bound and in part underlain by Precambrian rocks of the Canadian Shield as exposed in the Minto Arch, the Boothia Uplift, and on Melville Peninsula, eastern Devon Island, Ellesmere Island, and most of Baffin Island (Fig. 4-1).

The north-trending Boothia Uplift, which divides the Arctic Platform and Franklinian Geosyncline into eastern and western parts, developed mainly in Silurian and Devonian time in response to periodic faulting. The Sverdrup Basin, which in late Proterozoic and Mesozoic time was superimposed on the folded Franklinian Geosyncline, was itself folded in Cenozoic time. Relatively undisturbed Proterozoic sediments occur in several parts of the Arctic Islands, notably northern Baffin, Victoria, Somerset and Ellesmere islands. Comprehensive reviews of the evolution of the Canadian Arctic Islands are given by Thorsteinsson and Tozer (1970) and by Kerr (1981). A volume entitled Geology of the Innuitian Province has been prepared for the Geology Society of America's Decade in North America Geology project and should be released in 1990. Summaries of the mineral resources of the Arctic Islands have been prepared by the Geological Survey of Canada (1980a) and by Gibbins (1982, 1989).

The region's two operating mines, Cominco Ltd.'s Polaris Mine on Little Cornwallis Island and Nanisivik Mines Ltd.'s Nanisivik Mine at Strathcona Sound, northwest Baffin Island, are the two most northerly metal mines in the world. The 1986-1987 production from the two mines is estimated at 70 000 t of lead concentrate and 600 000 t of zinc concentrate. Zinc concentrate from the Nanisivik mine also contains considerable silver and cadmium (see Chapter 2).

During 1986 and 1987, mineral exploration activities in the Arctic Islands continued to decline from the record levels of 1980-83 (Gibbins, 1984, 1985) and failed to match 1984-85 levels (Gibbins, 1987). Except for small projects on Victoria Island and the Melville Peninsula in 1986, (Fig. 4-1) exploration during 1986 and 1987 was confined to the vicinity of the region's mines, Polaris and Nanisivik.

Several university theses relevant to Arctic mineral exploration were recently completed. Arne (1986) did a comprehensive study of fluid inclusions at the Nanisivik Mine and their bearing on ore genesis. Ghazban (1988) studied sulphur and carbon isotopes at Nanisivik. He determined that sulfate from seawater or evaporites was reduced by oxidation of hydrocarbons under hydrothermal conditions, and formation of light carbon dolomite. Neumann (1988) considers that ore deposition at Nanisivik took place in several pulses (seismic pumping) of hot brines along paleokarst structures. Nentwich (1987) describes the stratigraphy, sedimentology and breccia pipes in the Ordovician and Silurian Brodeur Group (Ship Point, Baillarge and Cape Crawford formations) of the Brodeur Peninsula, northwestern Baffin Island. The recent release of Thorsteinsson's (1986) map of Cornwallis and adjacent islands is also noteworthy.

The mineral rights of a large portion of northeastern Ellesmere Island (almost 40 000 km^2) were removed in June 1982 by Privy Council Order Number 1982-1875 as Ellesmere Island National Park Reserve. This includes parts of NTS areas 120 C-F and 340 D, E and H. An assessment of the mineral and hydrocarbon resource potential of this area was published by the Geological Survey of Canada (1981a).

In June 1984, representatives of the Government of Canada and the Committee for Original Peoples' Entitlement (COPE), representing the Inuvialuit of the western Canadian Arctic, signed final agreement for land rights settlement. Under this agreement, 13 000 km^2 (5000 sq. mi.) of lands, including surface and subsurface rights, were granted to COPE. These are known as 7(1a) lands and are mainly around Inuvialuit communities. The surface rights to another 78 000 km^2 (30 000 sq. mi.) of land, excluding subsurface rights, were also granted to COPE. The subsurface rights for these lands, known as 7(1b) lands, fall under legislation such as the Canada Mining Regulations and the Canada Oil and Gas Act. However, access to these lands requires that prior notice be given to the Inuvialuit. The 7(1b) lands are mainly in coastal areas of southern Banks Island, western Victoria Island and the adjacent mainland between the Crocker River and the Alaska border (Indian and Northern Affairs Canada, 1984).

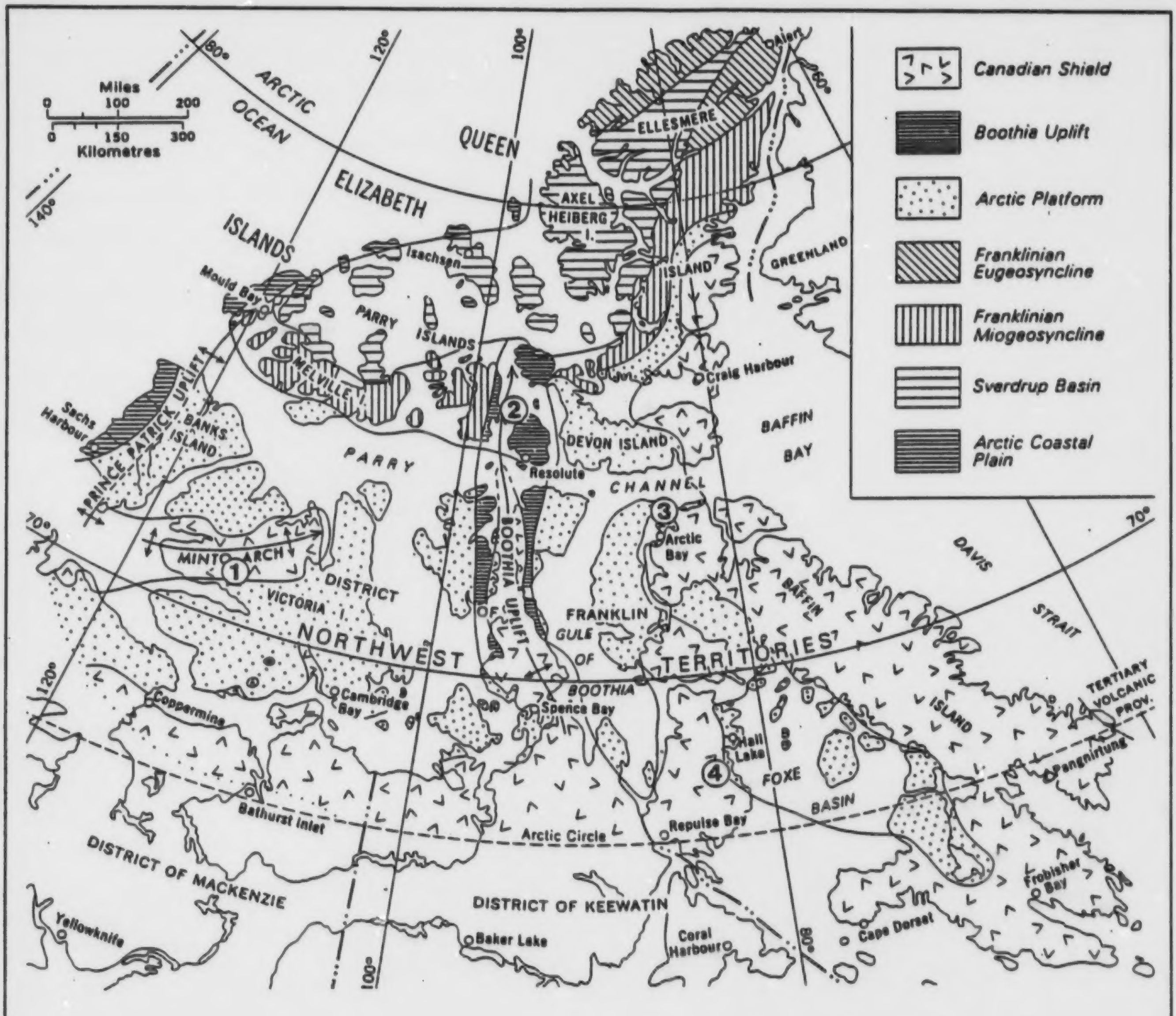
Scheduled jet service is available to Resolute Bay, Cambridge Bay, Nanisivik, Iqaluit (Frobisher Bay) and Hall Beach. Most Arctic settlements have scheduled Twin Otter flights at least once a week. Camp moves and resupply flights for exploration crews are usually by chartered Twin Otters equipped with oversize tires for landing directly on the Arctic tundra. These aircraft are normally available in Resolute Bay, Iqaluit and Hall Beach.

ACKNOWLEDGEMENTS

The author gratefully acknowledges continuing aircraft and logistical support provided by the Polar Continental Shelf Project and their staff, particularly during carvingstone investigations. Numerous carvers, pilots, geologists, company and government personnel and other northerners have greatly assisted the author at various stages of preparing these reports.

VICTORIA ISLAND

Victoria Island is underlain by crystalline Precambrian basement rocks, a concordant sequence of Proterozoic sediments known as the Shaler Group comprising clastics, carbonates and gypsum-anhydrite (Table 4-1). A younger unit, the Natkusiak Formation composed of basalt flows and volcaniclastics disconformably overlies these sedimentary rocks and follows the axis of the Holman Island Syncline. Closely related to these volcanics are widespread diabase-gabbro sills and dykes (Christie, 1964) that have the same age (650 Ma), chemical and petrological characteristics as the Coronation sills to the south (Baragar, 1977).


Canadian Shield
Boothia Uplift
Arctic Platform
Franklinian Eugeosyncline
Franklinian Miogeosyncline
Sverdrup Basin
Arctic Coastal Plain
Miles
0
100
200
0
150
300
Kilometres
80°
120°
100°
60°
140°
70°
ARCTIC OCEAN
QUEEN ELIZABETH ISLANDS
ELLESMERE
Alert
AXEL HEIBERG I.
ISLAND
GREENLAND
Isachsen
Mould Bay
PARRY ISLANDS
MELVILLE
Craig Harbour
Sachs Harbour
PRINCE PATRICK UPLIFT
BANKS ISLAND
DEVON ISLAND
BAFFIN BAY
PARRY
Resolute
CHANNEL
Arctic Bay
DAVIS STRAIT
MINTO ARCH
VICTORIA I.
DISTRICT
BOOTHIA UPLIFT
FRANKLIN
GULF OF BOOTHIA
BAFFIN ISLAND
NORTHWEST TERRITORIES
TERTIARY VOLCANIC PROV.
Coppermine
Cambridge Bay
Spence Bay
Hall Lake
FOXE BASIN
Pangnirtung
Bathurst Inlet
Arctic Circle
Repulse Bay
DISTRICT OF MACKENZIE
DISTRICT OF KEEWATIN
Frobisher Bay
Yellowknife
Baker Lake
Coral Harbour
Cape Dorset
①
②
③
④

ID	AREA	GEOLOGICAL TARGET	COMMODITY	ORGANIZATION
1.	Northwest Victoria Island	Proterozoic sediments and volcanics of Shaler Group	Copper, Silver	Panarctic Oils Ltd.
2.	Polaris Mine, Little Cornwallis Island	MVT deposits in Thumb Mountain Fm. dolomite	Zinc, Lead	Cominco Ltd.
3.	Nanisivik Mine, NW Baffin Island	MVT deposit in Society Cliffs Fm. dolomite	Zinc, Lead, Silver	Nanisivik Mines Ltd.
4.	Melville Peninsula	Iron formation	Gold, Iron, Zinc, Nickel	Borealis Exploration Ltd.

FIGURE 4-1: Geological provinces of the Arctic Archipelago showing areas of mineral exploration during 1986-87.

These rocks are exposed in the Minto Arch (Fortier *et al.*, 1963), a structure that dominates the geology of northwestern Victoria Island (1 in Fig. 4-1). Precambrian strata of the Minto Arch form a northeast-trending synform, the Holman Island Syncline (Figs. 4-2 and 4-3). The Minto Arch became a positive topographic feature during the Paleozoic and underlies most of the Diamond Jenness Peninsula, the Saneraun Hills and the Shaler Mountains (Fig. 4-2).

> The angular discordance between the Palæozoic and the Precambrian rocks of the Minto Arch demonstrates that the Walker Bay anticline and the Holman Island syncline were folded prior to deposition of the earliest Palæozoic rocks in the area. Later crustal movements, however, are clearly responsible for the present position of the Minto Arch as a structural high, or uplift, with homoclinal sequences of Palæozoic rocks dipping away from the Arch. There is no evidence in the stratigraphic column of the map-area to suggest that the Minto Arch underwent sudden uplift at any time. The essentially homoclinal sequence of Upper Cambrian(?) to Upper Devonian strata that extends through Prince Alberta Peninsula into northeast Banks Island presumably developed as a result of the positive movement that effected the Minto Arch. The uplift is, therefore, presumably Upper Devonian or later. Lower Cretaceous rocks rest unconformably upon the Palæozoic strata... and this suggests that the uplift of the Minto Arch took place prior to the Lower Cretaceous.
>
> The Boothia Arch, east of the map-area, is known to have moved positively, and relatively violently, in late Silurian to early Devonian time... Latest Silurian and early Devonian rocks are not exposed on Victoria Island; consequently there is no record of events for this period. It is conceivable that the Minto Arch moved in late Silurian or early Devonian time (i.e., at the time of movement of the Boothia Arch), but this is improbable (Thorsteinsson and Tozer, 1962, p. 72).

TABLE 4-1: TABLE OF FORMATIONS, VICTORIA ISLAND

QUATERNARY	
18	Areas of thick glacial drift; mainly morainal; outcrops of bedrock are very scarce.
	Unconformity.
ORDOVICIAN	
12	BLUE FIORD FORMATION: limestone, shale.
SILURIAN	
11	READ BAY FORMATION: limestone, dolomite, shale.
CAMBRIAN? ORDOVICIAN AND SILURIAN	
10	10a, Cambrian? sandstone, minor shale, siltstone, dolomite; 10b, Ordovician and Silurian, dolomite, minor chert, shale, sandstone.
	Unconformity.
LATE PRECAMBRIAN	
9	Gabbro dykes and sills; sill not mapped.
8	NATKUSIAK FORMATION: basalt flows; minor agglomerate.
	Low angle unconformity.
	SHALER GROUP (3-7c)
7c	KUUJJUA FORMATION: mainly coarse-grained quartz sandstone, minor conglomerate and limestone.
7b	UPPER KILIAN FORMATION: Sabkha-environment red and tan shaly limestone, grey sabkha carbonates with gypsum beds, and red siltstone.
7a	LOWER KILIAN FORMATION: varicoloured evaporitic mudstone and bedded gypsum/anhydrite.
6	WYNNIATT FORMATION: limestone, minor dolomite, shale, sandstone.
5	MINTO INLET FORMATION: gypsum, anhydrite, minor sandstone, limestone, shale, dolomite, siltstone.
4	REYNOLDS POINT FORMATION: limestone, sandstone, minor siltstone, shale.
3	GLENELG FORMATION: sandstone, limestone, dolomite, conglomerate.
	Unconformity.
2	HADLEY BAY FORMATION: quartzite, sandstone, rare conglomerate and dolomite.
	Unconformity.
1	Pink, coarse-grained granodiorite.

NORTHWEST VICTORIA ISLAND RECONNAISSANCE

Panarctic Oils Ltd.	Copper, Silver
P.O. Box 190	76 G/13; 78 B/14;
Calgary, Alta., T2P 2H6	87 E/13, F/16, G/1,
	H/3,4,7,9,10,15,16; 88 A/1
	70°52'-72°08'N,
	111°30'-116°30'W

REFERENCES

Baragar (1976, 1977); Christie (1964); Gibbins (1987); Jefferson (1985); Jefferson *et al.* (1985); Newbury (1969); Palmer and Hayatsu (1975); Thorpe (1972); Thorsteinsson and Tozer (1962).

DIAND assessment reports: 081858, 082091.

PROPERTY

Twenty-six prospecting permits (974-997, 1075 and 1076) encompass 643 120 ha.

LOCATION

The prospecting permits cover most of the volcanic rocks of the Natkusiak Formation of northwestern Victoria Island (Fig. 4-2) and can be divided into two groups. The southwest block, 10 permits, occupies the central core of Diamond Jenness Peninsula, immediately south of the Kuujjua River. The second group, 16 permits, includes most of the northeast-trending Saneraun Hills and Shaler Mountains (Figs. 4-2 and 4-3).

The area is 50 to 275 km northeast of Holman Island and roughly 425 km northwest of Cambridge Bay, the only established communities on Victoria Island. However, the Panarctic Oils Ltd. mineral camp was resupplied by Twin Otter STOL aircraft from their base at Rea Point, Melville Island, 500 km to the northeast.

HISTORY

Copper on Victoria Island was first reported by V. Stefansson in 1913 on the basis of reports given to him by Inuit in Prince Albert Sound. However, Thorsteinsson and Tozer (1962, p. 77) were the first people of European origin to observe copper ('a few small flecks and flakes') *in situ* in the volcanic rocks of the Natkusiak Formation.

During 1968-70, copper exploration in the Coppermine River area 'spilt over' to Victoria Island as the Muskox Syndicate, Grandroy Mines Ltd. and the M.J. Boylen Engineering Co. Ltd. prospected and explored the Natkusiak Formation for copper. Numerous copper showings were discovered and limited mapping, drilling and geophysical surveying were done in an attempt to delineate the economic potential of some of the best showings. Many of the initial targets were vein-type deposits, associated with a series of north-trending faults that transect the Proterozoic section (Thorpe, 1972, p. 141-145).

In 1982, a four-person crew of Panarctic Oils Ltd. collected stream water and stream sediment samples that were assayed for uranium, copper, silver, gold, nickel, iron and/or chromium (Gibbins, 1985). They also examined four areas of known copper showing, and four main types of copper-silver showings (Gibbins, 1985).

Panarctic Oils Ltd. acquired Prospecting Permits 974 to 997 on February 1, 1983, and 1075 and 1076 in 1985.

In 1983, several hundred stream sediment samples were collected and analyzed to complete coverage of the area. Sixteen copper-silver anomalies were outlined, prospected and geologically mapped. The area around the W-5 showing (Trident Creek area), which was discovered and drilled by the Muskox Mines Syndicate in the late sixties (Thorpe, 1972, p. 142), was prospected.

During the 1984 field season, 20 areas around stream sediment geochemical anomalies were examined; work included measuring and mapping several stratigraphic sections and prospecting. Numerous mineral showings were discovered and have been classified into several distinct types (Jefferson *et al.*, 1985, Table 27.2, p. 210). Detailed work was concentrated in two areas: Trident Creek area and Polar Bear Prospects area (Fig. 4-3), both of which are along the western side of the northern block of the Natkusiak Formation (Gibbins, 1987).

During June and July 1985, 17 holes (396.3 m) were drilled in the Parkall Valley area (southeast corner of Prospecting Permit 983) and the Newbury Creek area (south central Prospecting Permit 984).

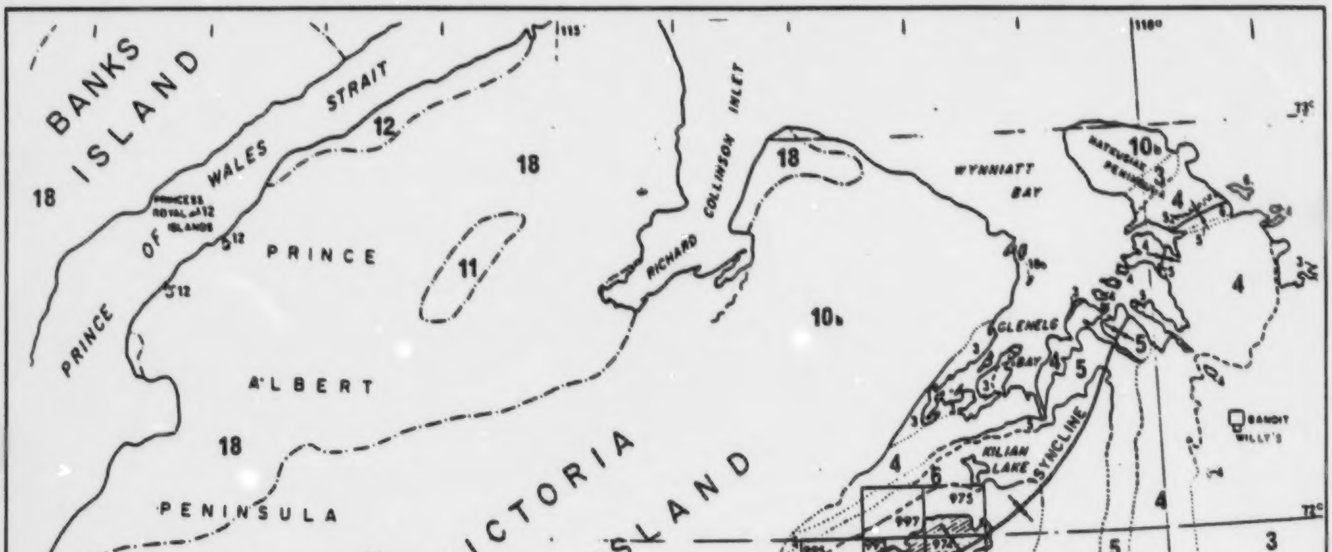

BANKS ISLAND
PRINCE OF WALES STRAIT
PRINCESS ROYAL ISLANDS
PRINCE ALBERT PENINSULA
VICTORIA ISLAND
COLLINSON INLET
RICHARD
WYNNIATT BAY
GLENELG BAY
KILIAN LAKE
SYNCLINE
MUSKOX CREEK
BANDIT WILLY'S
WALKER BAY ANTICLINE
WALKER BAY
MINTO INLET
KUUJJUA RIVER
DIAMOND JENNES PENINSULA
NEWBERRY CREEK
PARKALL CREEK
TAHIRYUAK LAKE
HOLMAN ISLAND
PRINCE ALBERT SOUND
115°
110°
73°
72°
71°
SCALE

FIGURE 4-2: Map of Precambrian geology and permit areas, northwestern Victoria Island, modified (from Thorsteinsson and Tozer, 1962). See Table 4-1 for legend.

Newbury Creek Area - PP 984

Eleven holes (300.9 m) tested a series of horizontal zones of chalcocite-native copper-malachite-prehnite-quartz-calcite minerals. These zones are parallel to horizontal flow banding in the Lower Recessive Member of the Natkusiak Formation.

Eight holes reached targeted depths without encountering significant copper minerals; three holes were abandoned in permafrost. Only scattered grains of copper and occasional veinlets of chalcocite were encountered.

Parkall Valley - PP 984 and 977

Six holes (83.7 m) tested a series of vertical chalcocite veins and veinlets in the volcaniclastic member of the Natkusiak Formation. These veinlets are associated with light green zones of alteration to bentonite. This bentonite alteration caused problems in drilling and forced four of the six holes to be stopped short of the main target. Drilling results were inconclusive.

All 26 permits have lapsed.

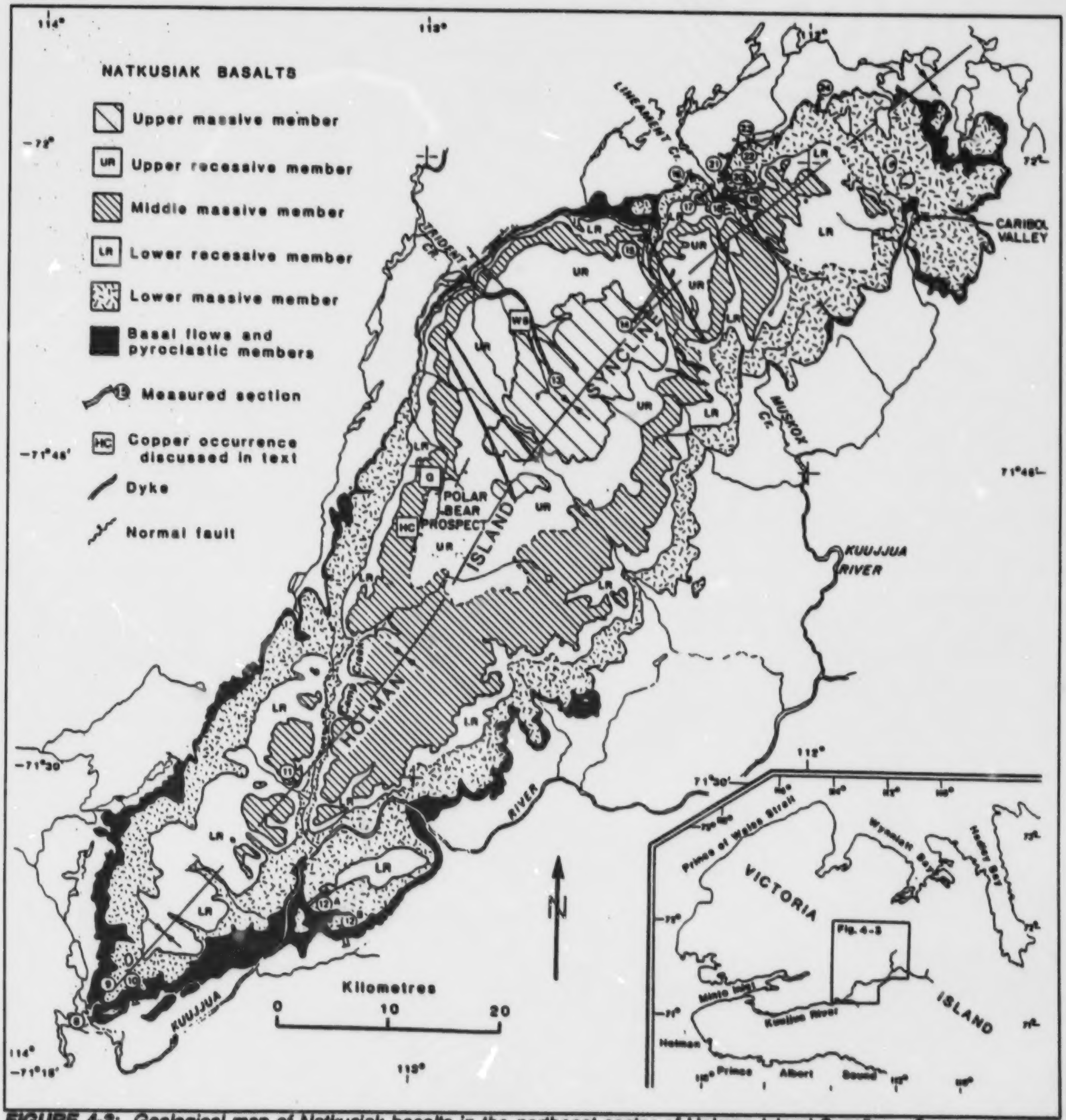

NATKUSIAK BASALTS
Upper massive member
UR Upper recessive member
Middle massive member
LR Lower recessive member
Lower massive member
Basal flows and pyroclastic members
Measured section
HC Copper occurrence discussed in text
Dyke
Normal fault
114°
113°
112°
72°
71°45'
71°30'
71°15'
LINEAMENT CR.
TRIDENT CR.
MUSKOX CR.
CARIBOU VALLEY
POLAR BEAR PROSPECT
HOLMAN ISLAND SYNCLINE
KUUJJUA RIVER
RIVER
KUUJJUA
W5
G
HC
UR
LR
Kilometres
0
10
20
N
Prince of Wales Strait
Wynniatt Bay
Hadley Bay
VICTORIA
ISLAND
Fig. 4-3
Minto Inlet
Kuujjua River
Holman
Prince Albert Sound
118°
112°
110°
73°
72°
71°

FIGURE 4-3: Geological map of Natkusiak basalts in the northeast sector of Holman Island Syncline. Copper showings are shown by letter (W5, G, HC). Numbers refer to measured sections (from Jefferson et al., 1985).

DESCRIPTION

The Natkusiak Formation, as defined by Thorsteinsson and Tozer (1962, p. 37) is a sequence of volcanic rocks comprising dark-coloured, basaltic flows and pyroclastic sediments. This formation rests disconformably on the Kuujjua and Kilian formations of the Shaler Group and includes the youngest Precambrian layered rocks in the area. The Natkusiak Formation is confined to Victoria Island, where it is exposed in two detached belts along the axis of the Holman Island Syncline. Landsat images clearly show a series of northwest-trending fractures that extend great distances into the Paleozoic sediments.

The formation is named for Natkusiak, late resident of Holman and well-known travelling companion of Arctic explorer Vilhjalmur Stefansson. Natkusiak's grave is in the Holman cemetery. The type section of the Natkusiak Formation is some 25 km south of Glenelg Bay, northern Victoria Island.

The formation attains a maximum thickness of about 300 m at about longitude 112°30'W. Where individual flows have been recognized, they are about 30 m thick. Amygdules commonly characterize the lower and upper parts of flows, whereas the middle section is dense basalt. Red and green agglomerate, commonly poorly indurated and cut by thin veins of calcite, is locally present at the base of the formation and ranges to 100 m in thickness. The agglomerate comprises fragments of volcanic rocks, bombs, and baked sedimentary rocks of various types that are embedded in a matrix of calcite and tuff. The volcanics are commonly chloritized and epidotized.

Baragar (1976, 1977) measured several sections of Natkusiak Formation volcanics for detailed geochemical and paleomagnetic studies. He related them to the Franklin magmatic province (or Franklin Magnetic Interval) of late Hadrynian time (600 Ma). They are the only known surface eruption of this event that also includes the Coronation dolerite sills and sheets (Christie, 1964) and the Franklin diabase dykes.

> The Natkusiak basalts are typical plateau basalts which have erupted, for the most part, in a subaerial environment. Each flow comprises a massive base, with the exception of a thin amygdaloidal zone at the bottom, and highly amygdaloidal top (Baragar, 1976, p. 350).

The Natukusiak Formation contains copper-bearing flood basalts similar to those of the Coppermine River area and the Keweenawan Peninsula of Upper Michigan. Reconnaissance prospecting in the late sixties resulted in the discovery of more than 100 showings of chalcocite, bornite, malachite, azurite, chalcopyrite and native copper (Thorpe, 1972, p. 142).

Newbury (1969) studied the copper showings of claims on the southwestern block of Natkusiak Formation (Diamond Jenness Peninsula). He described epigenetic native copper in permeable zones, prehnite-bearing vugs, amygdules and fractures. Chalcocite apparently formed at a water table from vadose copper-bearing fluids.

Jefferson *et al.* (1985) subdivided the Natkusiak Formation into six litho-stratigraphic members. Jefferson (1985) defined a sixth, uppermost unit of the Shaler Group, the Kuujjua Formation. The Kuujjua Formation is a distinctive quartzarenite that is restricted to the southwest half of the Holman Island Syncline area. It unconformably overlies the Kilian Formation and is in turn unconformably overlain by the Natkusiak Formation.

Jefferson (1985) also noted that the evaporites, sabkha limestones and dolostones of the upper Kilian Formation are lithologically similar and time equivalent to the Thundercloud Formation of the Mackenzie Mountains. However, evaporites and red alluvial mudstones of the Redstone River Formation, which overlies the Thundercloud Formation, appear to have no counterparts on Victoria Island. In addition, there are several other variations in the geology of the two areas (Jefferson, 1985, p. 108-109).

CURRENT WORK AND RESULTS

In July 1986, Noranda Exploration Co. Ltd. prospected and tested several geophysical techniques over the Holy Cow showing on Prospecting Permit 991 (HC in Fig. 4-3). In all, six geophysical techniques were used to test the tonnage potential of the copper mineralization: small coil EM systems (EM-31D and Apex double dipole), VLF EM, Maxmin II, equipotential (mise à la masse) and magnetics.

The mise à la masse survey was the most useful in determining the extent of the exposed copper mineralization. Copper mineralization was traced over a short strike length using this technique. The EM systems failed to define any bedrock conductors of interest. The magnetic survey produced an 'egg carton'-type surface. Almost all of what had been originally perceived as *in situ* copper showings turned out to be float. This is also the case in the area of the Genesis showings (G in Fig. 4-3), however, they may have been 2 or 3 km south-west of the 'main Genesis showing'.

CENTRAL ARCTIC: CORNWALLIS LEAD-ZINC DISTRICT

The Cornwallis Lead-Zinc District (Kerr, 1977b) is a 125 by 275 km area that corresponds to the northern Boothia Uplift and comprises Cornwallis Island, eastern Bathurst Island, most of Grinnell Peninsula, northwestern Devon Island, as well as several smaller islands, including Little Cornwallis and Truro islands. The most recent geological map of this area is by Thorsteinsson (1986).

In Late Cambrian to late Middle Ordovician time, the area formed part of the Franklinian Shelf (or miogeocline), which received mainly carbonate sediments (Cass Fiord, Cape Clay, Eleanor River, Thumb Mountain and Irene Bay formations) (Table 4-2), but also subtidal evaporites of late Early and early Middle Ordovician age (Baumann Fiord and Bay Fiord formations). A different facies configuration existed from Late Ordovician to earliest Devonian time: downwarping of outer parts of the shelf resulted in the deposition of slope and basin deposits (graptolitic shales and carbonates of Cape Phillips Formation) in northern and western parts of the area, while shelf carbonate deposition (Allen Bay Formation and Read Bay Group) continued in southern and eastern parts.

The Cornwallis Disturbance affected northern parts of the Boothia Uplift in Early Devonian time (Kerr, 1977a). Faulting of the crystalline basement along northerly trends caused faulting and folding of the lower Paleozoic cover. After an interval of uplift and erosion, the northern Boothia Uplift was unconformably overlapped by strata of the upper Lower Devonian Disappointment Bay Formation. The syntectonic and post-tectonic deposits of this unit are overlain by a thick platformal carbonate and clastic succession of latest Early Devonian to Late Devonian age (Blue Fiord Formation, Okse Bay Group, etc.). The Ellesmerian Orogeny of latest Devonian-Early Carboniferous age probably caused minor faulting only. The post-Devonian stratigraphic record is restricted to local outcrops of Carboniferous, Cretaceous and Tertiary strata, the latter two preserved in Tertiary grabens.

TABLE 4-2: FORMATIONS OF CORNWALLIS AND ADJACENT ISLANDS (from Thorsteinsson, 1986).

DEVONIAN

MIDDLE AND UPPER DEVONIAN

HECLA BAY FORMATION: Sandstone (?1000m)

MIDDLE DEVONIAN

BIRD FIORD FORMATION: Siltstone; sandstone; shale; minor limestone (175-225m)

Unnamed formation: limestone; minor dolomite and shale (20-100m)

LOWER DEVONIAN

DISAPPOINTMENT BAY FORMATION: dolomite; minor limestone, siltstone, shale, sandstone, conglomerate and gypsum (20-200m)

Unnamed formations: D-cg: dolomite-and-limestone conglomerate (0-70m) D-ss: sandstone; siltstone; minor conglomerate and limestone (0-50m)

SNOWBLIND BAY FORMATION: limestone-and-dolomite conglomerate; dolomite; limestone; siltstone; sandstone (+580m)

SOPHIA LAKE FORMATION: limestone; minor dolomite, siltstone, sandstone, shale and conglomerate (500-980m)

SILURIAN AND DEVONIAN

UPPER SILURIAN AND LOWER DEVONIAN

BARLOW INLET FORMATION: limestone; dolomite; minor shale, siltstone and sandstone (1410m)

SILURIAN

UPPER SILURIAN

DUORO FORMATION: limestone; dolomite; minor siltstone and shale (334-460m)

CAPE STORM FORMATION: dolomite; dolomitic limestone; limestone; minor siltstone and shale (520-670m)

ORDOVICIAN AND SILURIAN

UPPER ORDOVICIAN TO UPPER SILURIAN

ALLEN BAY FORMATION: dolomite; minor limestone and shale (1200-1375m)

ORDOVICIAN

UPPER ORDOVICIAN

IRENE BAY FORMATION: shale; minor limestone (30-45m)

MIDDLE AND UPPER ORDOVICIAN

THUMB MOUNTAIN FORMATION: limestone; dolomite; minor shale (340m)

MIDDLE ORDOVICIAN

BAY FIORD FORMATION: limestone; dolomite; minor shale, gypsum, anhydrite and solution breccia (440m)

LOWER AND MIDDLE ORDOVICIAN

ELEANOR RIVER FORMATION: limestone; minor dolomite and intraformational conglomerate (700m)

LOWER ORDOVICIAN

BAUMANN FIORD FORMATION: gypsum; anhydrite; minor limestone and intraformational conglomerate (750m)

Unnamed formation: limestone; minor sandstone, anhydrite and siltstone (290m)

CAPE CLAY FORMATION: limestone (87m)

CAMBRIAN AND ORDOVICIAN

MIDDLE CAMBRIAN TO LOWER ORDOVICIAN

CASS FJORD FORMATION: shale; limestone; minor sandstone, siltstone and anhydrite (+2177m)

LOWER DEVONIAN

BATHURST ISLAND FORMATION: sandstone; siltstone; limestone; shale (?450m)

UPPER ORDOVICIAN TO UPPER SILURIAN

CAPE PHILLIPS FORMATION: limestone; siltstone; dolomite; shale; minor chert (3000m in southeast, probably not more than 600m in northwest)

INTRUSIVE ROCKS

ORDOVICIAN

Diapiric gypsum, anhydrite (The Bay Fiord Formation or the Baumann Fiord Formation are the most probable source of these rocks)

CONTROLS ON MINERALIZATION

A number of empirical controls or guides to mineralization have been developed that account for most of the 15 known MVT showings in the region. Most of the showings, including the three main deposits, are in the upper bioclastic part of the Ordovician Thumb Mountain Formation (Kerr, 1977b). The country rock is invariably brecciated dolomite; secondary sparry dolomite veining referred to as 'pseudobreccia' is common. Most of the showings are within the bounds of the Cape Phillips Formation shale basin and are structurally higher, but stratigraphically lower, than the shale. In most cases where stratigraphic relationships can be determined, the showings are in areas where the Thumb Mountain Formation is unconformably overlain by the Disappointment Bay Formation. Solution and collapse features related to this surface may have provided structures for the transport and deposition of ore fluids (Kerr, 1977b).

A fifth control may be northerly trending, basement-controlled faults or fractures and anticlines related to development of the Boothia Uplift. Kerr (1977b) noted that the Thumb Mountain Formation was exposed during the Cornwallis Disturbance only where erosion cut deeply, primarily into anticlines, like the Crozier Strait Anticline.

In 1985 and 1986, mineral exploration was limited to drilling in the vicinity of the Polaris Mine (see Chapter 2 or Gibbins, 1990). Much of this was surface drilling designed to test the South Keel Zone for southern extensions. Some new ore was identified because ore reserves decreased by only 2.2 Mt despite 1 Mt mined and 2.7 Mt removed to account for probable losses in pillars (Cominco Annual Report, 1987).

Recent drill programs involved: 12 800 m (120 holes) in 1984, 9200 m (80 holes) in 1985, 10 050 m (73 holes) in 1986, and 15 800 m (102 holes) in 1987.

BORDEN BASIN-BORDEN PENINSULA, BAFFIN ISLAND

Borden Peninsula, part of northern Baffin Island, is 500 km north of the Arctic Circle. The Nanisivik Lead-Zinc-Silver District, hosted in the Society Cliffs Formation, is bounded by the Strathcona Sound and Adams Sound grabens and extends from Admiralty Inlet on the west to beyond Milne Inlet in the east-southeast (Fig. 4-4).

Most of Borden Peninsula is underlain by Neohelikian shales, quartzarenites, greywackes, arkoses, conglomerates and carbonates (Table 4-3). The carbonates commonly contain stromatolites or bioherms or both. About 90 to 150 m of tholeiitic plateau basalt is near the base of the sequence. Faulting occurred during deposition that took place in a southeasterly trending rift zone.

A complex assemblage of Aphebian-Archean gneisses is separated from the overlying Neohelikian strata by a nonconformity. A thin regolith is developed in a few places on the gneisses, which are commonly stained red for several metres below the nonconformity (Jackson *et al.*, 1978, p. 3).

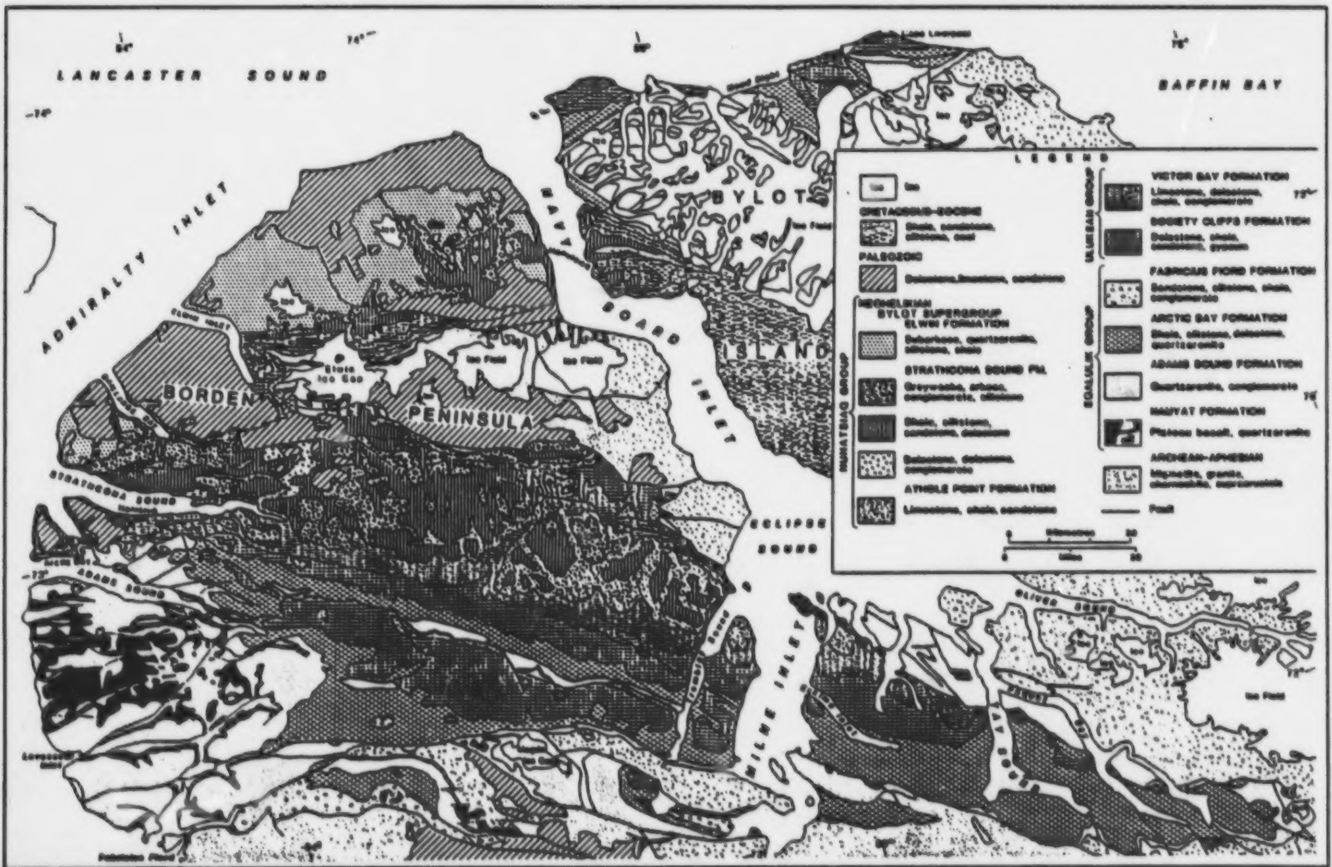

LANCASTER SOUND
BAFFIN BAY
ADMIRALTY INLET
BORDEN PENINSULA
BYLOT ISLAND
NAVY BOARD INLET
ECLIPSE SOUND
MILNE INLET
STRATHCONA SOUND
ADAMS SOUND
OLIVER SOUND
LEGEND
CRETACEOUS-EOCENE
PALEOZOIC
NEOHELIKIAN
BYLOT SUPERGROUP
ELWIN FORMATION
STRATHCONA SOUND FM.
ATHOLE POINT FORMATION
NUNATSIAQ GROUP
ULUKSAN GROUP
EQALULIK GROUP
VICTOR BAY FORMATION
SOCIETY CLIFFS FORMATION
FABRICIUS FIORD FORMATION
ARCTIC BAY FORMATION
ADAMS SOUND FORMATION
Quartzarenite, conglomerate
NAUYAT FORMATION
Plateau basalt, quartzarenite
ARCHEAN-APHEBIAN
Fault
Kilometres
Miles

FIGURE 4-4: Geology of the Borden Basin (from Jackson and Iannelli, 1981).

Mississippi Valley-type zinc-lead deposits are hosted by the Society Cliffs Formation at Nanisivik, Hawker Creek and elsewhere on Borden Peninsula. The Society Cliffs Formation is characterized by thick to massive beds of regularly laminated, brownish-grey to grey stromatolitic dololutite and dolosiltite. Planar stromatolites are ubiquitous; low domal varieties are common and cabbage-head types are less common (Jackson *et al.*, 1978). Society Cliffs strata are shallow, subtidal to intertidal in origin. A strong, fetid, petroliferous odour is normally given off by freshly broken rock. Dolomite breccia is common and some of this brecciation can be related to early karsting (Olson, 1984; Geldsetzer, 1973a,b).

Hadrynian diabase (Franklin Intrusions, Table 4-3) intrudes other known Precambrian rocks in the area including massive sulphide deposits. Remnants of flat-lying Paleozoic sandstones and dolomite extend onto Borden Peninsula from adjacent parts of Baffin Island.

Papers by Jackson and Iannelli (1981) and Jackson, Iannelli and Tilley (1980) give the most recent geological synthesis of the region.

TABLE 4-3: TABLE OF FORMATIONS, BORDEN BASIN (from Jackson and Iannelli, 1981).

HADRYNIAN			Franklin Intrusions: Diabase	
		GP	Intrusive Contact	
NEOHELIKIAN	BYLOT SUPERGROUP	NUNATSIAQ GROUP	Elwin Fm. (470-1320 m):	EL_2: Quartzarenite, siltstone EL_1: Sandstone, siltstone, dolostone
			Gradational	
			Strathcona Sound Fm: (430-910 m+)	SS_6: SS_{1-5} lithologies interbedded SS_5: Polymictic conglomerate SS_4: Siltstone, greywacke SS_3: Arkose-greywacke, shale SS_2: Dolostone, dolostone conglomerate SS_1: Shale, siltstone
			Gradational	
			Athole Point Fm: (0-385 m) Limestone, sandstone, shale	
			Gradational	Gradational to Unconformable
		ULUKSAN GROUP	Victor Bay Fm: (156-733 m)	VB_2: Limestone, dolostone, flat pebble conglomerate VB_1: Shale, siltstone, sandstone, limestone
			Conformable, Abrupt to Gradational	
			Society Cliffs Fm: (263-556 m)	SC_2: Stromatolitic & massive dolostones SC_1: Stromatolitic dolostone, shale, sandstone, gypsum
			Chiefly Unconformable?	Gradational to Unconformable
		EQALULIK GROUP	Fabricius Fiord Fm: (400-2000 m+) FF_4: Arkose, conglomerate, dolostone FF_3: Subarkose, conglomerate FF_2: Shale, quartzarenite FF_1: Quartzarenite, shale	Arctic Bay Fm: (180-770 m) AB_4: Shale, dolostone AB_3: Shale, siltstone AB_2: Shale, quartzarenite AB_1: Siltstone, quartzarenite
			Conformable, Abrupt to Gradational	
			Adams Sound Fm: (0-610 m) AS_3: Quartzarenite, conglomerate, shale AS_2: Quartzarenite AS_1: Quartzarenite, conglomerate	AS_U: Quartzarenite AS_L: Quartzarenite, conglomerate
			Conformable	
			Nauyat Fm: (0-420 m)	NA_2: Plateau basalt NA_1: Quartzarenite, subarkose, basalt
			Nonconformity	
ARCHEAN-APHEBIAN			Granitic gneiss basement complex: Migmatite, foliated granitic rocks, granite, charnockite, supracrustal relics	

SUMMARY OF RECENT MINERAL EXPLORATION

Mineral exploration in the Borden Basin has been mainly for Mississippi Valley-type lead-zinc deposits in the Society Cliffs Formation dolomite (Nanisivik Mines Ltd.) and for shale-hosted lead-zinc deposits in the Arctic Bay and Victor Bay formations.

In 1981, Nanisivik Mines Ltd. began regional exploration of the area underlain by Society Cliffs Formation by contracting Aerodat Ltd. to fly 5352 line-km of helicopter-borne magnetic, electromagnetic and VLF EM survey and Paterson, Grant and Watson Ltd. to compile and interpret this data. Some 150 EM and VLF EM conductors were identified as probably of bedrock origin and 74 of these were recommended for further investigation (Gibbins, 1984). Nanisivik Mines Ltd. obtained 14 prospecting permits in February 1982 to protect areas of interest.

In 1983, a Petro-Canada Ltd. subsidiary, 103912 Canada Inc., obtained 12 prospecting permits (957-968) that mainly include areas underlain by Arctic Bay Formation shales. In 1985, they obtained three more permits (P.P. 1044-1046) near Elwin Inlet. Nanisivik Mines Ltd. relinquished 13 of 14 prospecting permits at the beginning of 1984 and Petro-Canada Ltd. relinquished 9 permits (P.P. 957-965) at the beginning of 1985.

In 1982-83, Nanisivik Mines Ltd. did geochemical and geophysical surveys, geological mapping and prospecting in areas deemed to have favourable mineral potential (Gibbins, 1985, p. 123-132). Some of these areas were drilled in 1984. In 1985, Nanisivik Mines Ltd. concentrated on geophysical survey west and south of the mine area and geophysical surveys and drilling in the mine area. Nanisivik Mines Ltd.'s exploration budget for 1982-1985 was more than $5 million.

In 1984, Petro-Canada Ltd. completed geochemical and geological reconnaissance of their permit areas in the Arctic Bay Formation shales. In 1985, they concentrated on mapping and testing a silver-galena-barite showing near the head of Elwin Inlet.

In 1986 and 1987, Nanisivik Mines Ltd. carried out extensive drilling projects in the area of the Nanisivik Mine (Fig. 4-5). A total of 236 surface drill holes (20 950 m) were drilled on the DEB Zone, North Grid, Shale Hill, K-baseline, Area 14 NW and Oceanview-TGS #2 areas in 1986 at a cost of 1.7 million dollars. In 1987, 189 holes (12 700 m) were divided between surface drilling on the West Grid, Oceanview, Shale Hill, DEB east, and South Boundary Zone West areas and underground drilling, mainly in the Central Lower Lens of the Nanisivik Deposit. The 1986 and 1987 exploration has been successful to the extent that most of the ore mined in this period from the proven and probable ore reserve has been replaced (see Chapter 2).

NANISIVIK WEST PROJECT

Nanisivik Mines Ltd.	Zinc, Lead
12th Floor, 20 Toronto St.	48 C/1
Toronto, Ont., M5C 2B8	73°00-05'N
	84-85°W

REFERENCES

Blackadar *et al.* (1968); Geldsetzer (1973a, 1973b); Gibbins (1984, 1985, 1987); Gibbins *et al.* (1977); Jackson *et al.* (1978); Lemon and Blackadar (1963).

DIAND assessment reports: 082085 (Geophysics), 082074, 082085, 082110, 082111, 082112 (Drilling).

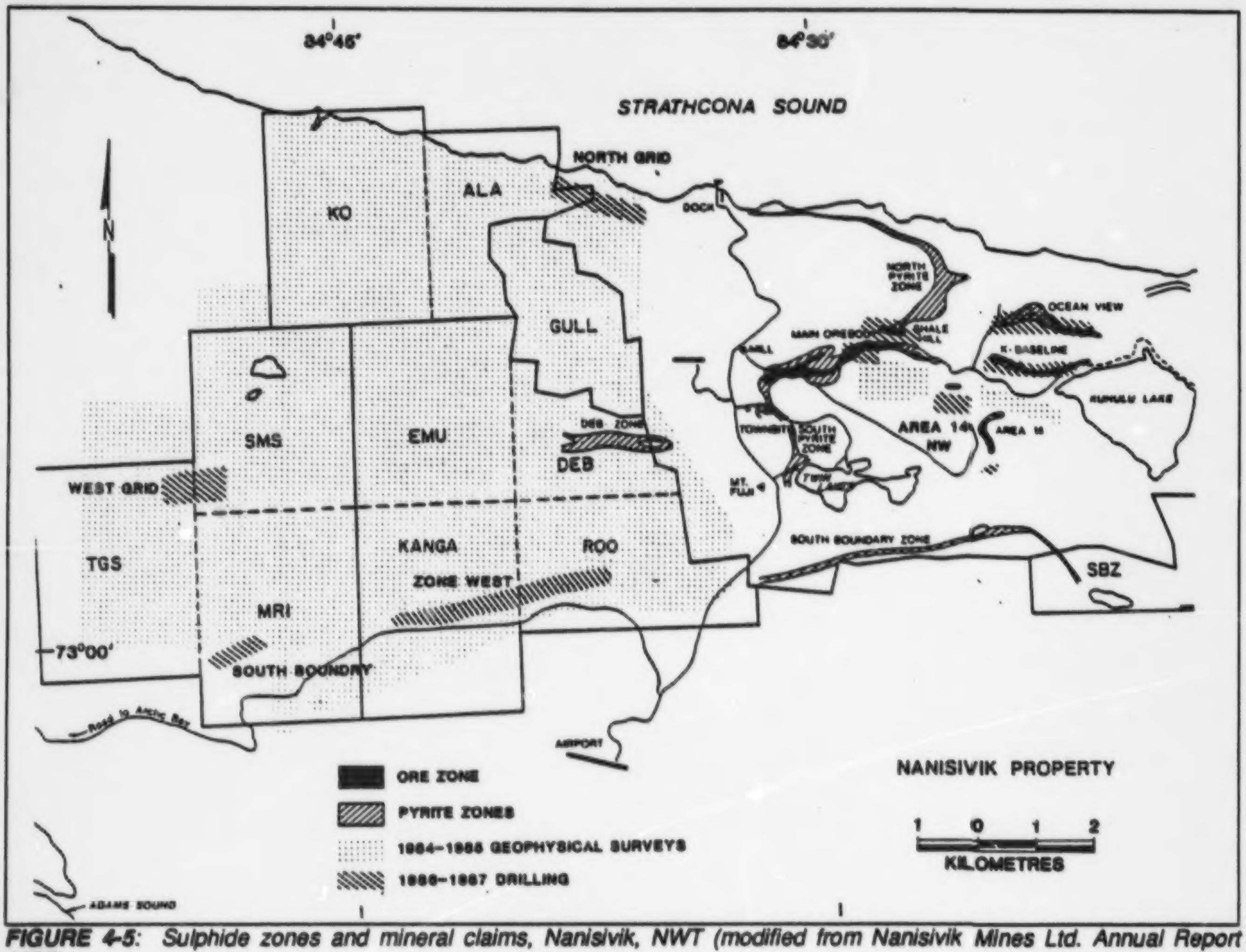

84°45'
84°30'
STRATHCONA SOUND
N
NORTH GRID
DOCK
KO
ALA
GULL
NORTH PYRITE ZONE
OCEAN VIEW
MAIN OREBODY
SHALE HILL
K-BASELINE
KUHULU LAKE
SMS
EMU
DEB ZONE
DEB
TOWNSITE
SOUTH PYRITE ZONE
AREA 14 NW
AREA 14
MT. FUJI
TWIN LAKES
WEST GRID
TGS
KANGA
ROO
SOUTH BOUNDARY ZONE
SBZ
ZONE WEST
MRI
73°00'
SOUTH BOUNDRY
Road to Arctic Bay
AIRPORT
ORE ZONE
PYRITE ZONES
1984–1986 GEOPHYSICAL SURVEYS
1986–1987 DRILLING
NANISIVIK PROPERTY
1 0 1 2
KILOMETRES
ADAMS SOUND

FIGURE 4-5: Sulphide zones and mineral claims, Nanisivik, NWT (modified from Nanisivik Mines Ltd. Annual Report 1985).

PROPERTY

Original block: GULL, DEB, EMU, KANGA, ROO
West block: TGS, MRI, SMS
North block: KO, ALA.

LOCATION

The claims adjoin the Nanisivik Mine property. They extend westerly from a point 2 km southwest of the Nanisivik townsite to 15 km southwest of the town, about half-way to the community of Arctic Bay (Fig. 4-5). The area is bordered on the north by Strathcona Sound and on the south by the Arctic Bay road.

HISTORY

The GULL claims were staked in 1972 to protect possible westward extensions of the Nanisivik deposit. Geological and VLF EM surveys were done on the claims in 1974 (Gibbins *et al.*, 1977). In 1976, a McPhar SS-15 system (vertical loop EM) detected several weak, unexplained anomalies.

In 1981, a regional geophysical survey of the area, comprising magnetic, coplanar and coaxial EM and two channels of VLF EM, was flown (Gibbins, 1984). The DEB claim was staked in 1982 to cover an airborne-detected anomaly (6-A2-4) south of the GULL claims.

In 1982, VLF EM, Max-Min EM, IP and magnetometer surveys on the DEB and the southeast corner of the GULL claims were designed to check for possible extensions of a strong conductor on the RAVEN claims just east of the GULL claims. The results were consistent with shallow conductive overburden. The magnetometer survey did not indicate any magnetic bodies (i.e., gabbro dykes).

Exploration on the nearby RAVEN claims led to discovery of dolostone of the Society Cliffs Formation in the southeast corner of the GULL claim group. This indicated that the southern part of the group probably has only a thin cover of shale and glacial drift and may be considered for exploration for massive sulphides within the Society Cliffs Formation.

Because of the favourable location and geology, Turam and IP surveys of the DEB and the adjacent RAVEN claims were extended into the GULL claims in 1983, despite the fact that previous geophysical surveys (VLF and vertical loop EM) did not yield indications of conductive sulphide minerals (Gibbins, 1985). The Turam EM Survey outlined two strong conductors extending up to 1500 m in an easterly direction at an interpreted depth of 100 km.

The geology of the GULL-DEB-RAVEN area was mapped in September 1983 by R. von Guttenburg of Metallgesellschaft Canada Ltd.

The remaining claims were staked during the summer of 1984. The GULL claims were permitted to lapse in November 1985 and were restaked in January 1986.

The McPhar GEM 8 system was chosen for 1984-85 reconnaissance geophysical surveys because it provides the deep penetration needed to identify massive sulphides like the DEB Zone. Interesting areas are then tested with closer spaced VLF EM, magnetometer and GEM 8 broadside surveys. In 1984, geophysical work consisted of reconnaissance and follow-up of the original block (DEB, EMU, KANGA and ROO claims), and reconnaissance of the western block (TGS, SMS and MRI). This work was contracted to Patterson, Grant and Watson Ltd. (DIAND assessment report 082085).

Early in 1984 (May and April), 18 holes (2882 m) outlined two east-trending lenses of massive pyrite at the Victor Bay Formation-Society Cliffs Formation contact. These lenses are known as the DEB Zone (Fig. 4-5). Two of these holes tested a 1983 IP anomaly just east of the DEB Zone, but no sulphides were found at the contact.

Late in 1984, 15 holes (2650 m) were drilled in 6 areas to test 10 anomalies. Karst-related oxidation, limonite-staining, dissolution and resedimentation were encountered in every area. Hematite mud in enlarged fractures and karst tubes probably accounts for most of the geophysical anomalies. Area 1 is south of Mount Fuji (LION 14 claim, Mineral Lease 2810). Here, the conductor is coincident with a fault that is down dropped at least 100 m on the west side. Specks and blebs of sphalerite were found in one hole. Anomalous areas 2 (ROO claims) and 3 (DEB claims) appear to be due to pyrite veinlets in Society Cliffs Formation dolostones. In Area 5 (EMU claim), the anomaly is caused by pervasive oxidation of collapsed dolostone shown by red hematite alteration and staining on fractures and clay zones. Areas 4 and 6 (MRL claim) appear to represent a westward extension of the South Boundary Zone, but unfortunately, the drills did not get through the overburden.

In 1985, the sequence of geophysical work was: follow-up on the western block, follow-up on the DEB claims, reconnaissance of the north block (KO and ALA claims) and follow-up of the north block.

Only one hole was drilled on these claims in 1985 as most of the 1985 drilling was done on targets in the immediate vicinity of the mine (Chapter 2). The single hole tested a geophysical anomaly on the GULL claims (Gibbins, 1987).

DESCRIPTION

The region is underlain by a sequence of Helikian sediments that are generally flat lying but commonly block faulted. The most recent regional geological maps are those of Blackadar *et al.* (1968) and Lemon and Blackadar (1963). However, the Geological Survey of Canada has done additional mapping in the area since 1977 (Jackson *et al.*, 1978).

THe GULL claims are underlain by dolomitic shales of the lower Victor Bay Formation and dolomite of the middle Victor Bay Formation. Society Cliffs Formation dolomite, which normally underlies the Victor Bay Formation and hosts the lead-zinc deposit at Nanisivik (Gibbins *et al.*, 1977), outcrops only in the southwest corner of the claims. Earlier geological mapping and drilling to the east of the claims suggested it is present at a depth greater than 120 m. Almost 450 m of Society Cliffs Formation has been measured in the region; thus it was expected to underlie the claims at depths between 120 and 670 m. However, it is now known to be closer to surface, even though extensive pre-Victor Bay karsting in the area prior to the deposition of Victor Bay Formation shales (Geldsetzer, 1973a, 1973b) may have removed some of the Society Cliffs Formation.

Northwest-trending diabase-gabbro dykes intrude the Victor Bay and Strathcona Sound formations in adjacent areas.

CURRENT WORK AND RESULTS

In 1986, numerous holes were drilled in the DEB zone (Fig. 4-5), and seven holes were drilled in the DEB EAST area in 1987. Also in 1987, three holes were drilled in the West Grid area (TGS and SMS claims) and two holes in the South Boundary Zone West (MRI, KANGA and ROO claims, Fig. 4-5). Economic sulphide minerals were not encountered in these areas.

MELVILLE PENINSULA

Mapping by Heywood (1967, 1974) and others (Henderson, 1983; Schau, 1984) shows that most of Melville Peninsula is underlain by Archean gneisses, migmatites and foliated to massive granitoid rocks. Among the oldest rocks of the region are folded and metamorphosed sedimentary and volcanic rocks of the Prince Albert Group. These supracrustal rocks are distributed in two major northeast-trending belts up to 20 km wide and at least 260 km long. In the central part of Melville Peninsula there are clastic metasedimentary rocks derived mainly from greywacke and interbedded with felsic to mafic metavolcanic rocks, with local komatiite or ultrabasics and iron formation.

A younger, Aphebian or Early Proterozoic sequence of supracrustal rocks, the Penrhyn Group, is widely distributed in the southern third of Melville Peninsula. These supracrustal rocks form northeast-trending belts separated by bands of Archean gneiss. The group is a lithologically varied sequence of pelitic and psammitic gneiss, calcium silicate gneiss, marble, quartzite and amphibolite. The Penrhyn Group is complexly folded. Textures and mineral assemblages indicate that Penrhyn Group paragneiss was subject to upper amphibolite-grade regional metamorphism after the last penetrative deformation event (Henderson, 1983, p. 10).

Along the west coast of Melville Peninsula, near Mackar Inlet, an 800 m thick sequence of weakly metamorphosed arkose and minor phyllite, conglomerate and marble rests unconformably on a metamorphosed regolith developed on Archean basement. Frisch (1982) named this sequence the Folster Lake Formation. Maurice (1979) investigated anomalously high uranium in lake sediment and water samples in this area, found that the granitic rocks are enriched in uranium, particularly near the unconformity, and concluded that this unconformity is an attractive target for uranium exploration.

Much of southern Melville Peninsula was covered by a National Geochemical Reconnaissance survey of lake sediments and waters (Geological Survey of Canada, 1978a, 1978b, 1981b) and an airborne radiometric survey under the aegis of the Uranium Reconnaissance Program (Geological Survey of Canada, 1979). Follow-up work by Cameron (1979) identified strong and coincident zinc and nickel anomalies related to sulphidic-graphitic paragneiss of the Penrhyn Group. Maurice (1979) noted that the lake sediment results show high uranium contents and particularly so for areas underlain by Penrhyn Group rocks.

Iron formation of the Prince Albert Group is widespread, thick and extensive (Shau, 1984) and can be readily traced on aeromagnetic maps. It consists mainly of magnetite and quartz with minor pyrite, hematite and carbonate; some sections average as much as 30% iron. Rusty-weathering zones or gossans, commonly containing disseminated sulphides, are present in many parts of the regions. Most are associated with the metavolcanic rocks of the Prince Albert Group.

The iron formation was systematically explored and staked by Borealis Exploration Ltd. in the summers of 1969 and 1970 (Wilson and Underhill, 1971; Laporte, 1974a). In 1982, Borealis Exploration Ltd. tested the A and B deposits near Roche Bay with 3500 m of drilling in anticipation of bringing the deposits into production. In 1983, trace amounts of gold and silver were detected in samples being tested for metallurgical purposes, and the 1982 core was relogged and sampled for gold (Gibbins, 1985, p. 135). Aquitaine Company of Canada Ltd. explored 24 prospecting permits in Southern Melville Peninsula between 1970 and 1973. Aquitaine's work included several thousand line kilometres of airborne magnetic, EM and radiometric surveys (Laporte, 1974a, 1974b; Padgham *et al.*, 1976).

Cominco Ltd. and Noranda Exploration Ltd. did some mineral exploration on Melville Peninsula in 1979 and 1980 respectively (Gibbins, 1983, 1984). However, Melville Peninsula has not been the scene of many major mineral exploration projects.

Between 1983 and 1985, Borealis Exploration Ltd. was granted 25 prospecting permits in Central Melville Peninsula. These permits were prospected on an 'airborne' reconnaissance level in 1984 and 1985 (Gibbins, 1987). The main target in the northern group (NTS 47 A, B) was gold in iron formation of the Prince Albert Group. In the southern group of permits (NTS 46 N, O, P), gossans and geochemical anomalies in supracrustal rocks of the Penrhyn Group are believed to have gold and base metal potential.

All but 6 of the 25 permits were allowed to lapse at the end of 1985. The remaining 6 permits have since lapsed.

PROSPECTING PERMIT 911

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	47 A/5 SE
540 5th Ave. SW	68°15'-68°30'N
Calgary, Alta., T2P 0M2	83°-89°W

REFERENCES

Heywood (1967); Schau (1984); Gibbins (1987).

DIAND assessment reports: 082421 (1986), 081766 (1985).

PROPERTY

Prospecting Permit 911.

LOCATION

Prospecting Permit 911 is in central Melville Peninsula, 15 to 55 km west of Roche Bay and 70 to 110 km east of Mackar Inlet.

HISTORY

The permit was granted in February 1983. NTS area 47 A/5 was previously covered by Prospecting Permit 58, granted to Borealis Exploration Ltd. in 1968.

Samples collected during 1984 and 1985 from pods of disseminated to massive arsenopyrite and pyrite in banded magnetite and sulphide-facies iron formation contained gold (Gibbins, 1987).

DESCRIPTION

The area is underlain by a greenstone belt of the Prince Albert Group (Heywood, 1967; Schau, 1984).

CURRENT WORK AND RESULTS

In 1986, exploration failed to establish continuity between the known gold anomalies. All but one of twelve samples assayed less than 0.01 g/t Au. Nickel (maximum 0.013%) and zinc assays (maximum 0.068%) are considered insignificant.

The permit lapsed in 1988.

PROSPECTING PERMIT 1001

Borealis Exploration Ltd.	Gold
1700 Aquitane Tower	47 A/11 SW
540-5th Ave. SW	68°40'N
Calgary, Alta., T2P OM2	82°45'W

REFERENCES

Gibbins (1987); Schau (1984).

DIAND assessment reports: 082421 (1986), 081767, 081964 (1984/85).

PROPERTY

Prospecting Permit 1001.

LOCATION

Prospecting Permit 1001 is 60 km west of Hall Beach. It includes the westernmost shore of Hall Lake and adjacent area.

HISTORY

The permit was granted February 1, 1984. A number of gossans were found in Prospecting Permit 1001 during an aerial reconnaissance survey in 1984. Gold is associated with sulphide-facies iron formation and arsenopyrite. Detailed work in 1985 showed that there are two types of sulphide mineralized showings. The first is disseminated arsenopyrite and pyrite in silicate-facies iron formation and narrow, discontinuous, silicified gossan zones in basalt. The second is pods of massive arsenopyrite within and along contacts of oxide-facies iron formation. Several grab samples from these 1 to 3 m wide pods assayed from 144 to 1380 ppb Au (Gibbins, 1987).

DESCRIPTION

The area is underlain by Prince Albert Group metavolcanic rocks (Shau, 1984). The permit area is at the northeastern end of the eastern block of Prince Albert Group metavolcanics where the normal northeast trend is deflected northerly and even north-northwesterly. The area has undergone intense deformation and metamorphism.

CURRENT WORK AND RESULTS

In 1986, two traverses and eleven grab samples in an area southwest of the 1984-85 work failed to find gold. One sample, containing 20% pyrite and pyrrhotite, assayed 0.11% nickel.

Permit 1001 lapsed in 1989.

PROSPECTING PERMITS 1064 AND 1065

Borealis Exploration Ltd.	Zinc, Nickel
1700 Aquitane Tower	46 N/1
540 5th Ave. SW	67°7.5'-67°15'N
Calgary, Alta., T2P OM2	84°-84°30'W

REFERENCES

Cameron (1979); Geological Survey of Canada (1978a, 1978b); Henderson (1983); Laporte (1974a).

DIAND assessment reports: 082422 (1986), 081961 (1984/85).

PROPERTY

Prospecting Permit 1064 (46 N/1 NE).
Prospecting Permit 1065 (46 N/1 NW).

LOCATION

The permit area is in central southern Melville Peninsula, 16 to 28 km north of the northeast end of Lyon Inlet and 105 to 120 km northeast of the community of Repulse Bay.

HISTORY

NTS area 46 N/1 was covered by Prospecting Permit 180 issued to Aquitaine Company of Canada Ltd. between 1970 and 1972. They identified anomalous radioactivity in the southern half of the area (Laporte, 1974a, p. 123-125).

In 1977, a regional lake sediment geochemical survey outlined a number of zinc anomalies in the permit areas (Geological Survey of Canada, 1978a, 1978b). In 1978, Cameron (1979) conducted detailed follow-up work in several of these areas, tracing anomalous base metal readings to their sources by sampling surface waters. He outlined two areas that have high zinc and nickel content.

Prospecting Permits 1064 and 1065 were granted February 1985.

Field work in 1985 was largely confined to the southeast quarter of Prospecting Permit 1064 and the northwest corner of Prospecting Permit 1065 where Cameron (1979) had identified zinc and nickel anomalies in surface water.

Samples of pelitic gneiss from Prospecting Permit 1064 were not enriched in base metals. This was not surprising because, as Cameron (1979) pointed out, recent oxidation would have removed any base-metal sulphide minerals from the surface. Several soil samples from Permit 1064 did contain anomalous concentration of zinc and nickel. The highest assay was 6200 ppb Zn, 2850 ppb Ni and 248 ppb Co.

A soil geochemistry survey of the northwest corner of Prospecting Permit 1065 confirmed the zinc and nickel anomalies of Cameron (1979). One sample assayed 4400 ppb Zn and 1160 ppb Ni. The next best sample contained less than 500 ppb Zn.

DESCRIPTION

The area is underlain by Penrhyn Group supracrustal rocks and Archean granite to granodiorite gneisses (Henderson, 1983).

CURRENT WORK AND RESULTS

In 1986, two grids were established in Prospecting Permit 1064 and one grid in Prospecting Permit 1065. These grids are centred on zinc anomalies discovered by Cameron (1979). Detailed mapping at 1:2000 scale, and rock and soil geochemistry were done on the grid areas. Samples were analyzed for gold, silver, cobalt, nickel, lead and zinc. In addition, Bloom field-test kits were used to test for zinc in water samples.

Rusty pelitic gneiss underlies the main area of interest on both the east and centre grids in Permit 1064. Five areas of anomalous zinc content, corresponding to rusty pelitic gneiss, were defined in Permit 1065. The best assay, 3.3 g/t Au, was for a sample from the east grid.

Drilling to test for 'possible massive sulphide mineralization' in rusty pelitic gneiss was recommended for all three grids. However, the permits were allowed to lapse in 1988.

REFERENCES

Arne, D.C., 1986:
A study of zonation at the Nanisivik Zn-Pb-Ag mine, Baffin Island, Canada; Unpub. M.Sc. Thesis, Thunder Bay, Canada, Lakehead University, 194 p.

Baragar, W.R.A., 1976:
Natkusiak basalts, Victoria Island, District of Franklin; Geological Survey of Canada, Paper 76-1A, p. 347-352.

________, 1977:
Volcanism of the stable crust; *in* Volcanic Regimes in Canada, eds. Baragar *et al.*; Geological Association of Canada, Special Paper 16, p. 377-405.

Blackadar, R.G. 1970:
Precambrian geology, northwestern Baffin Island, District of Franklin; Geological Survey of Canada, Bulletin 191, 89 p.

Blackadar, R.G., Davidson, W.L. and Trettin, H.P., 1968:
Arctic Bay - Cape Clarence, District of Franklin; Geological Survey of Canada, map 1237A, 48 C.

Cameron, E.M., 1979:
Investigation of base metal mineralization in Proterozoic metasediments, Melville Peninsula, NWT; *in* Current Research; Geological Survey of Canada, Paper 79-1A, p. 187-196.

Christie, R.L., 1964:
Diabase-gabbro sills and related rocks of Banks and Victoria Islands, Arctic Archipelago; Geological Survey of Canada, Bulletin 105, 13 p.

Fortier, Y.O., Blackadar, R.G., Glenister, B.F., Greiner, H.R., McLaren, D.J., McMillan, N.J., Norris, A.W., Roots, E.F., Souther, J.G., Thorsteinsson, R. and Tozer, E.T., 1963:
Geology of the north-central part of the Arctic-Archipelago, NWT (Operation Franklin); Geological Survey of Canada, Memoir 320, 671 p.

Frisch, T., 1982:
Precambrian geology of the Prince Albert Hills, western Melville Peninsula, NWT; Geological Survey of Canada, Bulletin 346, 70 p.

Geldsetzer, H., 1973a:
The tectono-sedimentary development of an algal dominated Helikian succession on northern Baffin Island, NWT; *in* Canadian Arctic Geology, eds. J.D. Aitken and D.J. Glass; Geological Association of Canada - Canadian Society of Petroleum Geologists, p. 101-126.

________, 1973b:
Syngenetic dolomitization and sulfide mineralization; *in* Ores in Sediments, eds. G.C. Amstutz and A.M. Bernard; Springer-Verlag, p. 115-127.

Geological Survey of Canada, 1978a:
Regional lake sediment and water geochemical reconnaissance data, Melville Peninsula, NWT, (46N and part of 47B); Geological Survey of Canada, Open File 521.

________, 1978b:
Regional lake sediment and water geochemical reconnaissance data, Melville Peninsula, NWT, (46O, P and part of 47A); Geological Survey of Canada, Open File 522.

________, 1979:
Uranium reconnaissance, airborne gamma ray spectometry data, Melville Peninsula, NWT, NTS 46E, J-O; 47 A-F; Geological Survey of Canada, Geophysical series maps 35147G to 36546G.

________, 1980:
Non-hydrocarbon mineral resource potential of parts of northern Canada; Geological Survey of Canada, Open File 716, 377 p.

________, 1981a:
Mineral and Hydrocarbon Resource Potential of the Proposed Northern Ellesmere Island National Park, District of Franklin (parts of 120 and 340), NWT; Geological Survey of Canada, Open File 786.

________, 1981b:
National geochemical reconnaissance, Melville Peninsula, NWT; 46N, O, P; 47A (S 1/2); 47 B (S 1/2); Geological Survey of Canada, Open File 738.

Ghazban, Fereydoun, 1988:
Geological and Stable Isotopical Studies of Carbonate-Hosted Lead Zinc Deposits Nanisivik, Northern Baffin Island, NWT, Canada, Ph.D. Thesis, McMaster University, Hamilton, Ontario, 375 p.

Gibbins, Walter A., 1982:
Mining developments, mineral inventory and metallogenic models: Arctic Ragions, NWT, Canada; *in* Arctic Geology and Geophysics, eds. A.F. Embry and H.R. Balkwill; Canadian Society of Petroleum Geologists, Memoir 8, p. 113-133.

________, 1983:
Arctic Islands Region; *in* Mineral Industry Report 1979, NWT Geology Division, DIAND, EGS 1983-9, p. 53-68.

________, 1984:
Arctic Islands Region; *in* Mineral Industry Report 1980/81, NWT Geology Division, DIAND, EGS 1984-5.

________, 1985:
Arctic Islands Region; *in* Mineral Industry Report 1982/83, NWT Geology Division, DIAND, EGS 1985-4, p. 95-155.

________, 1987:
Arctic Islands Region; *in* Mineral Industry Report 1984/85, ed. C.E. Ellis, NWT Geology Division, DIAND, p. 55-91.

________, 1990:
Mineral resources of the Inuitian Region, in the Inuitian Region, Geology of North America, DNAG v. E, Chapter 20D, ed. H.P. Trettin, Geological Survey of Canada, p. XXX-XXX.

Gibbins, Walter A., Seaton, J.B., Laporte, P.J., Murphy, J.D., Hurdle, E.J., and Padgham, W.A., 1977:
Mineral Industry Report 1974, NWT Geology Division, DIAND, EGS 1977-5, p. 26-69.

Henderson, J.R., 1983:
Structure and metamorphism of the Aphebian Penrhyn Group and its Archean basement complex in the Lyon Inlet area, Melville Peninsula, District of Franklin; Geological Survey of Canada, Bulletin, 324, 50 p.

Heywood, W.W., 1967:
Geological notes, Northeastern district of Keewatin and southern Melville Peninsula, District of Franklin, NWT (parts of NTS 45, 47, 56, 57); Geological Survey of Canada, Paper 66-40, 20 p.

Heywood, W.W., 1974:
Geological reconnaissance of Northern Melville Peninsula, District of Franklin; *in* Reports of Activities; Geological Survey of Canada, Paper 74-1A, 381 p.

Indian and Northern Affairs Canada, 1984:
The Western Arctic Claim - The Inuvialuit Final Agreement; 115 p.

Jackson, G.D. and Iannelli, T.R., 1981:
Rift related cyclic sedimentation in the Neohelikian Borden Basin, northern Baffin Island; *in* Proterozoic Basins of Canada, ed. F.H.A. Campbell; Geological Survey of Canada, Paper 81-10, p. 269-302.

Jackson, G.D. Iannelli, T.R. Narbonne, G.M. and Wallace, P.J., 1978:
Upper Proterozoic sedimentary and volcanic rocks of northwestern Baffin Island; Geological Survey of Canada, Paper 78-14, 15 p.

Jackson, G.D., Iannelli, T.R. and Tilley, B.J., 1980:
Rift-related Proterozoic sedimentation and volcanism on northern Baffin Island and Bylot Islands, District of Franklin; *in* Current Research, Part A; Geological Survey of Canada, Paper 80-1A, p. 319-328.

Jefferson, C.W., 1985:
Uppermost Shaler Group and its contact with Natkusiak basalts, Victoria Island, District of Franklin; *in* Current Research; Geological Survey of Canada, Paper 85-1A, p. 103-110.

Jefferson, C.W., Nelson, W.E., Kirkham, R.V., Reedman, J.H., and Scoates, R.F.J., 1985.
Geology and copper occurrences of Natkusiak basalts, Victoria Island, District of Franklin; *in* Current Research, Geological Survey of Canada, Paper 85-1A, p. 203-214.

Kerr, J. W., 1977a:
Cornwallis Fold Belt and the mechanism of basement uplift; Canadian Journal of Earth Science, v. 14, p. 1374-1401.

________, 1977b:
Cornwallis Lead-Zinc District, Mississippi Valley-type deposits controlled by stratigraphy and tectonics; Canadian Journal of Earth Science, v. 14, p. 1402-1426.

________, 1981:
Evolution of the Canadian Arctic Islands: a transition between the Atlantic and Arctic Oceans; *in* The Ocean Basins and Margins, v. 5, The Arctic Ocean, eds. A.E.M. Nairn, M. Churkin, Jr. and F.G. Stehli; p. 105-199.

Laporte, P.J., 1974a:
Mineral Industry Report 1969 and 1970, v. 2, NWT, east of 104° West longitude; INAC, EGS 1974-1, 191 p.

________, 1974b:
Mineral Industry Report 1971 and 1972, v. 2, NWT, east of 104° West longitude; INAC, EGS 1974-2, 86 p.

Lemon, R.R.H. and Blackadar, R.G., 1963:
Admiralty Inlet area, Baffin Island, District of Franklin; Geological Survey of Canada, Memoir 328, 84 p.

Maurice, Y.T., 1979:
A preliminary assessment of the uranium potential of southern Melville Peninsula, District of Franklin; *in* Current Research, Geological Survey of Canada, Paper 79-1A, p. 281-286.

Nentwich, F.W., 1987:
Stratigraphy and Sedimentology of the Ordovician and Silurian Brodeur Group, Northern Brodeur Peninsula, Baffin Island; Ph.D. Thesis, University of Alberta, 457 p.

Neumann, M.U.C., 1988:
Geologie und Mineralogie der Zn/Pb Lagerstätte Nanisivik, Baffin Island, NWT, Kanada; Ph.D. Thesis, Ruprecht-Karls-Universität, Heidelberg, 143 p.

Newbury, M.C., 1989:
Studies on the copper mineralization of the Natkusiak Formation, Victoria Island, Arctic Canada; unpublished B.Sc. Thesis, Queen's University, 45 p.

Olson, R.A., 1984:
Genesis of paleokarst and strata-bound zinc-lead sulfide deposits in a Proterozoic dolostone, Northern Baffin Island, Canada; Economic Geology, v. 79 no. 5, p. 1056-1103.

Padgham, W.A., Seaton, J.B., Laporte, P.J. and Murphy, J.D., 1976:
Mineral Industry Report 1973, NWT Geology Division, DIAND, EGS 1976-9, 211 p.

Palmer, H.C. and Hayatsu, A., 1975:
Paeomagnetism and K-Ar dating of some Franklin lavas and diabases, Victoria Island; Canadian Journal of Earth Science, v. 12, no. 8. p. 1439-1447.

Sangster, D.R., 1981:
Three potential sites for the occurrence of stratiform, shale-hosted lead-zinc deposits in the Canadian Arctic; *in* Current Research, Geological Survey of Canada, Paper 81-1A, p. 1-8.

Schau, M., 1977:
Komatiites and quartzites in the Archean Prince Albert Group; *in* Volcanic Regimes in Canada, eds. Baragar *et al.*; Geological Association of Canada, Special Paper No. 16, p. 341-354.

________, 1984:
Geology of northern Melville Peninsula; Geological Survey of Canada, Open File 1046.

Thorpe, R.I.,1972:
Mineral exploration and mining activities, mainland Northwest Territories, 1966 to 1968 (excluding Coppermine River area); Geological Survey of Canada, Paper 70-70-, 204 p.

Thorsteinsson, R., 1973:
Prince Alfred Bay (59 B), Resolute (58 F), Baillie Hamilton Island (58 G), Lowther Island (68 E), and McDougall Sound (68 H) map areas, Arctic Islands; Geological Survey of Canada, Open File 139.

________, 1986:
Geology of Cornwallis Island and neighbouring smaller islands, District of Franklin, NWT, Geological Survey of Canada, Map 1626A, Scale 1:250 000.

Thorsteinsson, R. and Tozer, E.T., 1962:
Banks, Victoria and Stefansson Islands, Arctic Archipelago; Geological Survey of Canada, Memoir 330, 85 p.

________, 1970:
Geology of the Arctic Archipelago; *in* Geology and Economic Minerals of Canada, ed. Douglas, R.J.W.; Geological Survey of Canada, Eco. Geology Report 1, p. 548-590.

Wilson, I.D.H. and Underhill, D.H., 1971:
The discovery and geology of major new iron deposits on Melville Peninsula, Eastern Arctic: Canadian Mining Journal, v. 92, p. 40-48.

CHAPTER 5
KEEWATIN REGION

Kate Hearn
Research Geologist

INTRODUCTION

Mining and mineral exploration in the Keewatin Region during 1986-87 was monitored by District Geologist P.J. Laporte, who was succeeded by K. Griep in January, 1987. The Keewatin Region is the mainland area of the NWT east of 102°W and covers a portion of the Churchill Province. Consolidated rocks of the area comprise Archean volcanics and sediments, intruded and bordered by granitic and gneissic batholiths and migmatite terrain. Archean rocks are unconformably overlain by Aphebian metasedimentary and volcanic rocks which are preserved locally in downfaulted blocks. The rocks were regionally deformed and metamorphosed during the Proterozoic Hudsonian Orogeny. Intercratonic rifting during the Hudsonian Orogeny was accompanied by the deposition of Dubawnt Group sediments.

ECONOMIC GEOLOGY

The Churchill Province is recognized for its metallogenic association with polymetallic volcanogenic sulphide deposits, lode gold deposits, uranium deposits and nickel-copper deposits. Locations and summary details of mineral deposits significant with respect to possible development, or evaluation of regional mineral potential, are given in Figure 5-1 and Table 5-1.

The exploration focus in 1986-87 was on gold and uranium. Work continued on uranium targets defined in the late 1970s and early 1980s, while exploration for gold intensified. Increased interest in gold manifested as the highest number of hectares being staked since the end of the uranium boom in 1981.

Two projects were the subject of advanced exploration during 1986-87. Work on the Kiggavik Uranium Project (summarized in this chapter), included feasibility studies and continued definition drilling of the deposit. At the Fat Lake Gold Project (summarized in this chapter), definition drilling continued and underground exploration and bulk sampling was completed.

The 1986-87 exploration projects for the Keewatin Region have been grouped under three main headings, based on the geological setting. The headings are:

The Ennadai Lake - Rankin Inlet area.
The Baker Lake - Thelon area.
The Chantry Inlet - Wager Bay area.

Projects and areas are indicated on Figure 5-1 and listed in Table 5-1.

CARIBOU PROTECTION MEASURES

Exploration is constrained between May 15 and September 1 by the Caribou Protection Measures, a series of restrictions appended to the land use permits for the District of Keewatin. Protection measures were introduced in 1980 and have been summarized in previous Mineral Industry Reports (Laporte, 1984, 1985b, 1987).

ENNADAI LAKE - RANKIN INLET AREA

The Rankin-Ennadai belt comprises three separate but closely related east- to northeast-trending basins of Archean and Aphebian rocks. The basins coalesce to form a belt 380 km long. An east-trending Archean basin about 64 km wide occupies the northeastern portion of the belt shown in Figure 5-1 (Goodwin, 1973). Archean rocks are Kaminak Group volcanic flows and pyroclastics, slate, greywacke and conglomerate (Laporte, 1987) with abundant oxide-facies iron formation north of Kaminak Lake and local sulphide- and carbonate-facies iron formation in the immediate Kaminak Lake area (Goodwin, 1973). The Kaminak Group has been divided into one incomplete and four complete cycles of volcanism and a number of felsic volcanic centres with associated exhalite zones are recognized in the belt (Ridler and Shilts, 1974). Another basin, formerly considered to be Aphebian rocks of the Rankin Inlet area, is north of the main trend of the Rankin-Ennadai belt and has been redefined by Tella (1986) as Archean rocks recording two cycles of volcanism.

The Archean rocks are unconformably overlain by Aphebian rocks of the Hurwitz Group, consisting of conglomerate, greywacke, quartzite, orthoquartzite, argillite and dolomite, interbedded with and overlain by basaltic flows in the east (Laporte, 1987).

During the Hudsonian Orogeny, the assemblage was folded about northeasterly trending axes (Laporte, 1987). A relict zone of albite/epidote greenschist metamorphism (Kaminak Group), where Archean east-trending folds are preserved (Davidson, 1972), is flanked by higher metamorphic grades resulting from overprinting during the Hudsonian Orogeny (Ridler and Shilts, 1974).

Most exploration in 1986-87 concentrated on the gold potential of the Kaminak Group. Ridler and Shilts (1974) compared the Kaminak Lake area to the Noranda area of the Abitibi. Therefore, most exploration models used were derived from work in the Abitibi where mineral showings and ore deposits lie preferentially within volcanic complexes and are commonly associated with centres of felsic volcanism (Goodwin and Ridler, 1970).

ANT CLAIMS

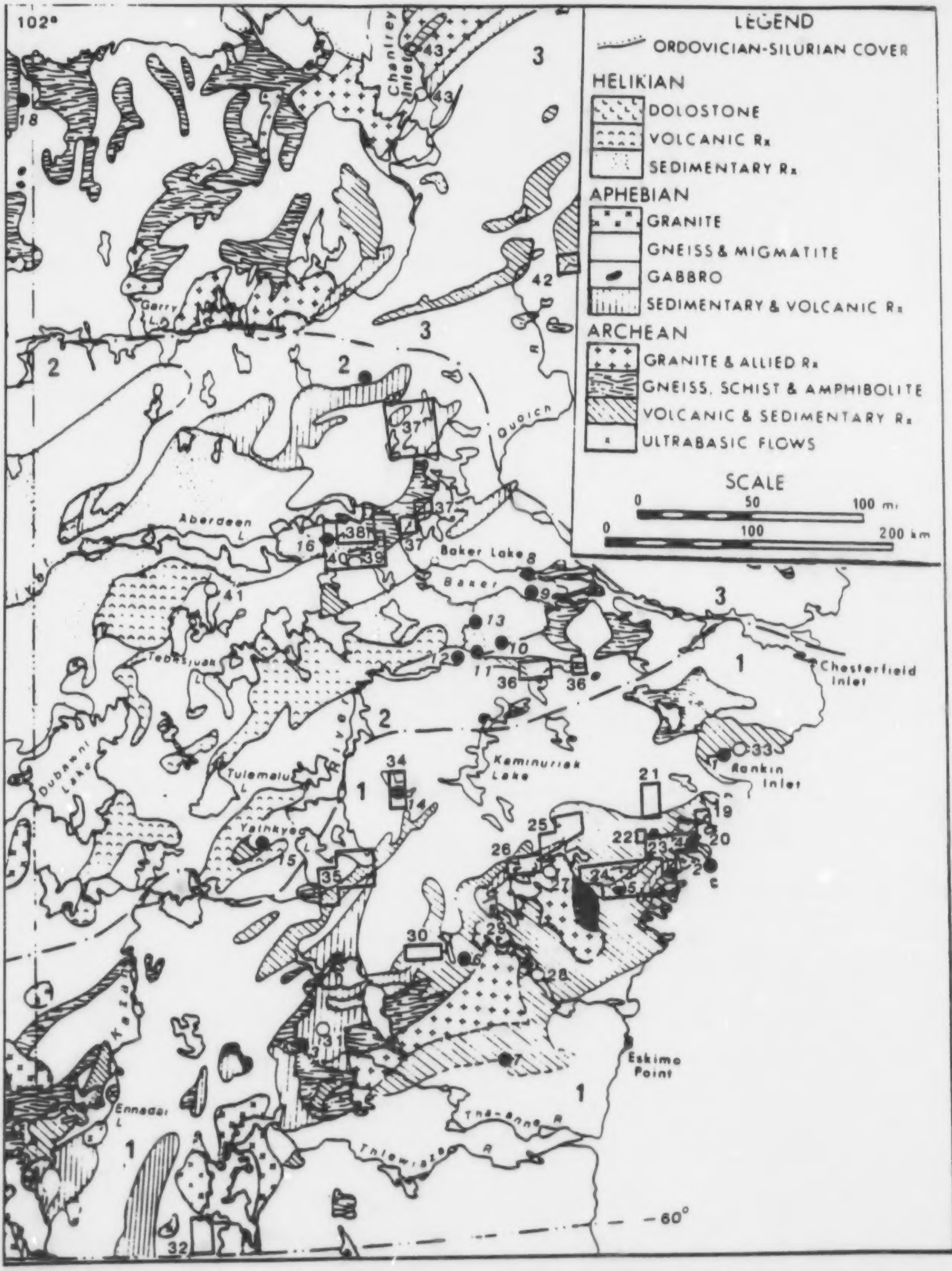
Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 K/7,2
Calgary, Alta., T2P 0M2	62°01'-62°29'55"N
	92°37'40"-92°48'55"W

REFERENCES

Heywood (1973).
DIAND assessment reports: 082416, 082486, 082523.

PROPERTY

ANT 1-4 (F12055-F12058).
ANT 5 (F12054).
SON 1 (F12060).



LEGEND
ORDOVICIAN-SILURIAN COVER
HELIKIAN
DOLOSTONE
VOLCANIC Rx
SEDIMENTARY Rx
APHEBIAN
GRANITE
GNEISS & MIGMATITE
GABBRO
SEDIMENTARY & VOLCANIC Rx
ARCHEAN
GRANITE & ALLIED Rx
GNEISS, SCHIST & AMPHIBOLITE
VOLCANIC & SEDIMENTARY Rx
ULTRABASIC FLOWS
SCALE
0
50
100 mi
0
100
200 km
102°
60°
Chantrey Inlet
Garry L
Aberdeen L
Baker Lake
Baker
Quoich
Chesterfield Inlet
Tebesjuak L
Dubawnt Lake
Tulemalu L
Kaminuriak Lake
Rankin Inlet
Yathkyed L
Ennadai L
Kazan
River
Eskimo Point
Tha-anne R
Thlewiaza R
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FIGURE 5-1: Geology map of the Keewatin Region showing subdivisions: 1) Ennadai Lake-Rankin Inlet area 2) Baker Lake-Thelon River area 3) Chantry Inlet-Wager Bay area; mineral deposits and 1986-87 exploration projects.

TABLE 5-1: MINERAL DEPOSITS OF THE KEEWATIN REGION (summarized from Cain and Brown, 1986)

	DEPOSIT ●	GRADE	TONNAGE (tonnes)	COMMENTS
1	RANKIN NICKEL	Cu 0.93%, Ni 3.20%, Pt 3.77% plus Cu 0.93%, Ni 1.25%	405 972 58 514[illegible]	Past producer, 1957-62. Platinum grade given was reported in 1929. No figure for platinum is available from 1957 reserve estimates stated at left, prior to the commencement of mining. Produced 2631 t Cu and 9662 t Ni from 368 099 t of ore. National Mineral Inventory.
2	TERM POINT	Au n.a.*	unknown	Past producer, 1918, 1928, 1987. Total production is 9.1 kg Au. 1987 production was 2.7 kg Au from 0.5 t. "Mine Finders" by B.F. Townsley, Saturday Night Press, Toronto (1935) and George Cross News Letter, Oct. 22, 1987.
3	CULLATON LAKE GOLD MINES		1 031 284	Past producer, 1981-85. Cullaton Lake (B Zone) produced 2395.9 kg Au at 16.8 g/t and 439.66 kg Ag from 225 727 t of ore. Shear Lake produced 830.2 kg Au at 7.2 g/t and 61.33 kg Ag from 168 997 t. Company reports and DIAND assessment reports. Reserves from Canadian Mines Handbook, 1985-86.
4	MAR	Cu 0.81%, Ni 0.08%	0.064 million	National Mineral Inventory.
5	FAT LAKE	Au 10 g/t	50 000	Tonnage from assessment report of Borealis' exploration program. DIAND assessment report 062274.
6	HENINGA LAKE	Zn 9.0%, Cu 1.3% Ag 68.6 g/t, Au 1 g/t	5.44 million	National Mineral Inventory.
7	ICE	Fe 20-40%	400 million	Tonnage from GSC OF 716 (p. 29), 1981.
8	BAKER LAKE - NORTH SHORE	U_3O_8 0.5-1.08% Mo n.a.*	unknown	Up to 453.6 t of U_3O_8 and 907 t of MoS_2. National Mineral Inventory.
9	CHRISTOPHER ISLAND	U_3O_8 0.04% Mo n.a.*		Greater than 72 t of U_3O_8 and 68 t of MoS_2. National Mineral Inventory.
10	BISSETT CREEK	U_3O_8 0.05-0.62%	unknown	Mineralized zone intersected down to 150 m depth. National Mineral Inventory.
11	KAZAN RIVER	U_3O_8 0.01-0.22% Cu 0.3-1.45%	unknown	Mineralized zone 183 m by 61 m and 36 m deep. National Mineral Inventory.
12	KAZAN RIVER	U_3O_8 0.05-0.81% Cu 0.3-1.45%	unknown	Mineralized zone to 350 m depth. National Mineral Inventory.
13	KAZAN FALLS	U_3O_8 0.46%	unknown	455 t of U_3O_8 in fracture system 1.8 m wide and 90 m deep (Northern Miner, August, 1974). National Mineral Inventory.
14	FERGUSON LAKE	Cu 0.9%, Ni 0.8%	7.3 million	Personal communication, P.J. Laporte, DIAND, Yellowknife.
15	LAC CINQUANTE	U_3O_8 1.10%	0.48 million	Estimated resource of 5289 t of U_3O_8 in drill indicated and inferred tonnage. Abermin application for listing, Vancouver Stock Exchange, January 16, 1986.
16	KIGGAVIK	U_3O_8 0.6% Pb trace-50%	3.63 million	Contains 18 144 t of U_3O_8. Northern Miner, Nov. 8, 1984 and Sept. 23, 1987.
17	AMER LAKE	U_3O_8 n.a.* Mo n.a.*	unknown	National Mineral Inventory.
18	PERRY RIVER	Cu 0.5%, Ni 1.25%	unknown	"L showing" boulder train showing, some Cu-Ni minerals *in situ* but of lower grade. National Mineral Inventory.

n.a.* not available

1986-87 Exploration Projects

19. ANT CLAIMS
20. WHALE COVE PROPERTY
21. PROSPECTING PERMITS 1084, 1085
22. BANNOCK LAKE SHOWING
23. IGLOO PROJECT
24. KEEWATIN GOLD PROJECT & FAT LAKE DEPOSIT
25. HAPPY LAKE PROJECT
26. PROSPECTING PERMITS 1082, 1083
27. PETER CLAIMS
28. ERIC AND MAGUSE LAKE PROSPECTS
29. TURQUETIL LAKE PROJECT
30. PROSPECTING PERMITS 1106, 1107
31. SUNDOG PROJECT
32. SANDYBEACH PROPERTY
33. MELIADINE RIVER PROJECT
34. FERGUSON LAKE PROPERTY
35. SY PROJECT
36. PARKER LAKE PROJECT
37. BAKER LAKE PROJECT
38. SCHULTZ LAKE PROJECT
39. SAM CLAIMS
40. SISSONS-SCHULTZ PROJECT
41. MARJ CLAIMS
42. PROSPECTING PERMIT 1090
43. QUILIK, M CLAIMS

○ Project areas

LOCATION

ANT 1-4 and SON 1 are on the north shoreline of Pistol Bay, approximately 48 km southwest of Rankin Inlet. ANT 5 is on Morso Island, 16 km south of the Hamlet of Whale Cove (Fig. 5-2).

HISTORY

From 1961 to 1962, Tavane Exploration (North Rankin Nickel Mines) carried out prospecting, trenching and reconnaissance, along with packsack drilling and EM surveys in the Pistol Bay area. Arsenopyrite in volcanics, diorite intrusions, quartz veins and gossans were found. Assays of up to 41 ppm Au were reported from a sample of a vein in the Pistol Bay area with an exposed strike length of 110 m and widths up to 1.3 m. A quartz vein sample from Morso Island yielded 2 ppm Au.

In 1969 and 1970, Marouba Holdings Ltd. trenched and mapped in the Pistol Bay and Morso Island areas. The best assays for samples from the two areas were 45 ppm Au, 55 ppm Ag, 0.07% Cu and 0.09% Ni and 26 ppm Au, 29 ppm Ag, 0.89% Cu and 0.08% Ni, respectively. In 1970, Husky Oil held claims and permits in the area and established a small grid for an EM survey.

Five Star Petroleum and Mines Ltd. acquired the MAR claims in 1970 and 1971. Kenting Earth Sciences Division was contracted to do an EM survey of the Pistol Bay area; Five Star completed a corresponding magnetometer survey. A total of 265 m in six diamond-drill holes tested geophysical targets, but no economic mineral concentrations were intersected.

In May 1972, J. Antoshkiw excavated two trenches on Morso Island and completed 59 m of diamond drilling in two holes. No assays were reported, but visible gold in drill core was noted in the logs.

A number of companies, including Aberdeen Minerals and Silver Chief Minerals, examined showings in the area between 1972 and 1981. In 1976, Sik Sik Golden Copper Mines Ltd. drilled one hole totalling 22.8 m. No assays were reported, but arsenopyrite and visible gold were noted in a quartzite intersection.

ANT 1-5 and SON 1 were staked by J. Antoshkiw in 1985.

DESCRIPTION

Kaminak Group basalt and andesite flows, in part pillowed, with associated tuff and agglomerate, minor breccia, related synvolcanic intrusions and derived schists and gneisses, underlie the Pistol Bay claim group. A basal sequence of siltstone and argillite hosts carbonate-, oxide- and sulphide-facies iron formation. The volcanics are intruded in the northeast and west by quartz diorite plutons. Aphebian orthoquartzites of the Kinga Formation overlie the volcanics and granodiorite (Fig. 5-2).

ANT 5, on Morso Island, covers massive Kaminak Group basalts and synvolcanic intrusions of gabbro and anorthositic gabbro. The complex is intruded by granodiorite dykes related to an offshore granodiorite intrusion.

CURRENT WORK AND RESULTS

J.W. Campbell (DIAND assessment report 082486) examined the property for Borealis in 1986 and the claims were transferred to Borealis Exploration Ltd. in January 1987.

In 1987, fracture controlled sulphide-bearing quartz veins on ANT 5 on Morso Island were geologically mapped and sampled. One quartz vein, traced discontinuously for 1270 m, pinches and swells to a maximum width of 2 m. Locally the vein contains pyrite, chalcopyrite and arsenopyrite. Samples taken from quartz veins and shear zones on the island assayed trace to 1 ppm Au and trace to 5.6 ppm Ag.

In 1987, ANT 1-4 and SON 1 at Pistol Bay were geologically mapped and rocks were sampled. Main targets were zones of hydrothermal alteration, gossans and iron formations. A 1 to 4 m wide quartz-carbonate vein was traced for a strike length of 300 m. Of the 19 samples taken from the vein and wallrock, 15 assayed in excess of 100 ppb Au. A 1 m sample of sulphide-enriched wallrock assayed 22 ppm Au and 1.4 ppm Ag.

WHALE COVE PROPERTY

Borealis Exploration Ltd.
960, 540 5th Ave. SW
Calgary Alta., T2P 0M2

Gold, Silver,
Copper, Nickel
55 K/1,2
62°22'-62°14'N
92°26'-92°38'W

REFERENCES

Heywood (1973); Laporte (1974a, 1976); Wright (1967).
DIAND assessment report: 082691.

PROPERTY

BSX 5-6 (F10090-F10091).
BSX 7-10 (F14660-F14663).

LOCATION

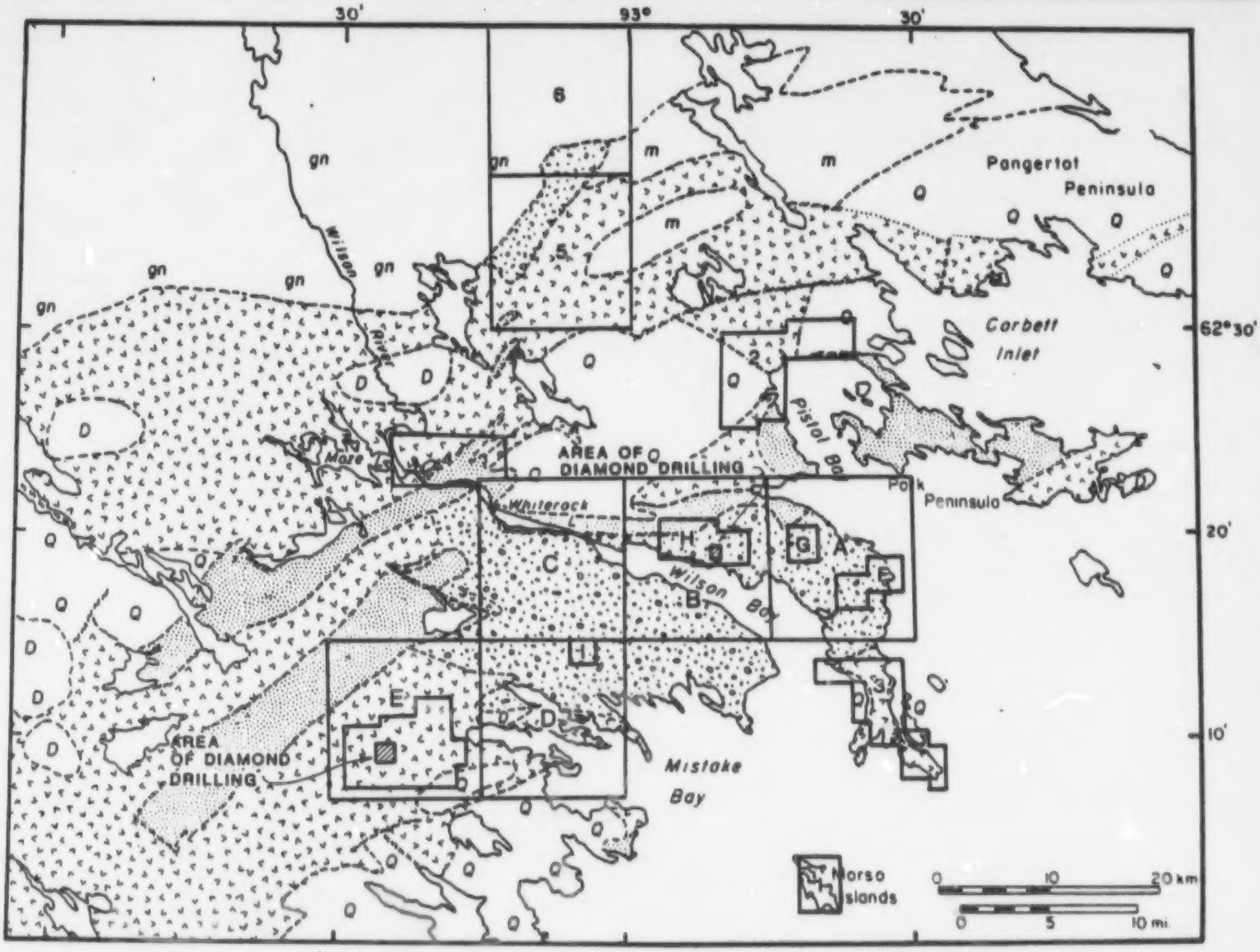
The property is 75 km south of Rankin Inlet. The Hamlet of Whale Cove is at the periphery of the claims, which cover a 20 km long peninsula extending into Hudson Bay (Fig. 5-2).

HISTORY

In 1928, a 500 kg bulk sample of quartz-carbonate material was taken from the "Term Point" Occurrence on the peninsula. The sample purportedly yielded 5.38 kg of gold.

The first recorded work on the peninsula was in 1961 when the Tavane Syndicate, a subsidiary of Rankin Nickel Mines, examined the area and delineated gossans in shears, tuffs, pillow selvedges, joints and cracks. Massive pyrite, chalcopyrite, marcasite and pyrrhotite as well as minor malachite, azurite and bornite were observed. Veinlets of massive molybdenite are associated with irregular, sucrosic aplite dykes. On the CAT claims in the Copper Cove area, massive chalcopyrite in an amphibolite-hosted gossan, 2.5 m by 12.0 m in area, was channel sampled. Channel samples assayed up to 24.38% Cu and 0.4% Ni. An EM survey of the area defined anomalies that were tested by three diamond-drill holes totalling 174 m. Channel samples from the JAN claims near Jawbone Cove, about 2 km east-northeast of Whale Cove, assayed up to 177 ppm Au, 84 ppm Ag and 2.70% Cu.

In 1969 the MAR claim group was staked by J. Gorski for Maroubra Holdings Ltd. The claims covered ground immediately north of Whale Cove. Three diamond-drill holes totalling 23 m were completed and trenches were excavated on the Copper Cove showing. Reported assays were up to 5.45% Mo, 6.70% Cu and 0.22% Ni. Samples taken from an area corresponding to the CAT claims assayed 4.5% to 6.7% Cu and 0.09 % to 0.22% Ni. The claims lapsed between late 1972 and early 1973.


30'
93°
30'
62°30'
20'
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6
5
gn
m
Q
D
Pangertot
Peninsula
Corbett
Inlet
Pistol Bay
Polk
Peninsula
AREA OF
DIAMOND DRILLING
Maze
Whiterock
Wilson River
Wilson Bay
A
B
C
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1
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Mistake
Bay
AREA
OF DIAMOND
DRILLING
Norso
Islands
0
10
20 km
0
5
10 mi

LEGEND

APHEBIAN

HURWITZ GROUP:

▨ Orthoquartzite, slate and mudstone, mafic volcanic flows, quartzose and feldspathic sandstone

APHEBIAN and/or ARCHEAN

m Gneiss and migmatite

gn Layered gneiss and quartz-biotite schist

D Diorite, gabbro

ARCHEAN

Q Quartz diorite, granodiorite and quartz monzonite

KAMINAK GROUP

▨ Slate, argillite, impure sandstone, greywacke, iron-formation, conglomerate

▨ Mafic to felsic volcanic rocks

PROPERTIES

Canadian Nickel Company Ltd.

A. P.P. 1020
B. P.P. 1021
C. P.P. 1073
D. P.P. 1018
E. P.P. 1019
F. IGLOO 12-13
G. IGLOO 11
H. IGLOO 1-3
I. IGLOO 14
J. IGLOO 4-10

Borealis Exploration Company Ltd.

1. ANT 5
2. ANT 1-4, SON 1
3. WHALE COVE PROPERTY
4. BANNOCK PROJECT
5. P.P 1084
6. P.P. 1085

FIGURE 5-2: *Geology and properties explored during 1986 and 1987, Wilson Bay area (geology after Heywood, 1973).*

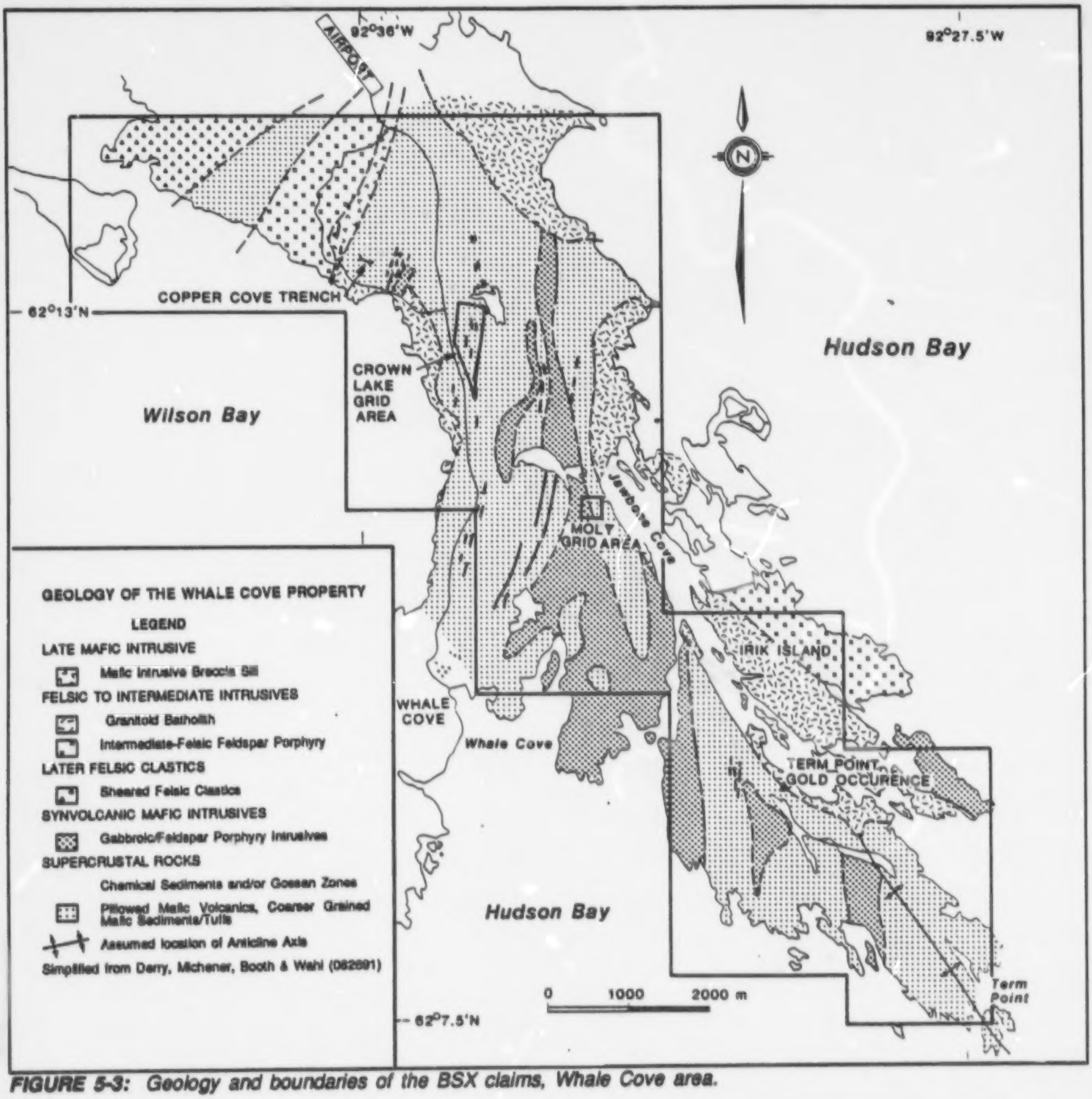

92°36'W
AIRPORT
92°27.5'W
N
COPPER COVE TRENCH
62°13'N
CROWN
LAKE
GRID
AREA
Wilson Bay
Hudson Bay
Jawbone Cove
MOLY
GRID AREA
IRIK ISLAND
WHALE
COVE
Whale Cove
TERM POINT
GOLD OCCURENCE
Hudson Bay
0
1000
2000 m
Term
Point
62°7.5'N
GEOLOGY OF THE WHALE COVE PROPERTY
LEGEND
LATE MAFIC INTRUSIVE
Mafic Intrusive Breccia Sill
FELSIC TO INTERMEDIATE INTRUSIVES
Granitoid Batholith
Intermediate-Felsic Feldspar Porphyry
LATER FELSIC CLASTICS
Sheared Felsic Clastics
SYNVOLCANIC MAFIC INTRUSIVES
Gabbroic/Feldspar Porphyry Intrusives
SUPERCRUSTAL ROCKS
Chemical Sediments and/or Gossan Zones
Pillowed Mafic Volcanics, Coarser Grained Mafic Sediments/Tuffs
Assumed location of Anticline Axis
Simplified from Derry, Michener, Booth & Wahl (082691)

FIGURE 5-3: Geology and boundaries of the BSX claims, Whale Cove area.

The ground was restaked in 1972 and 1973 as the HI and MINE claims and ownership was transferred to Mont-Alta Projects Ltd. Four diamond-drill holes totalling 200 m and nine trenches tested showings on the property.

In 1977, W.D. Groves examined the Jawbone Cove area for E.A. Tipman. A number of old showings and molybdenum-bearing quartz veins were evaluated. Tipman staked MB 1 and ANITA 1 to cover the molybdenum showing.

DESCRIPTION

The peninsula is underlain by basalts, andesites and associated interflow sediments of the Kaminak Group. Mafic volcanics are massive to pillowed and in places exhibit variolitic, amygdular and porphyritic textures. Interflow chemical sediments with associated sulphide- or silicate-facies iron formation and epiclastic rocks are found within the volcanic assemblage which is intruded by fine- to medium-grained, locally porphyritic, mafic dykes and sills, and feldspar porphyry dykes. Volcanics comprise 60% of outcrop area. Late mafic intrusions include fine-grained mafic dykes, subordinate lamprophyre dykes and an intrusive breccia. The breccia, 1.5 km in strike length, contains fragments of sulphide-facies iron formation (Fig. 5-3). Felsic sediments or pyroclastics overlay the succession and outcrop in the northwest of the claim group. Supracrustal rocks are intruded on the east and west shorelines of the peninsula by quartz diorite, granodiorite and quartz monzonite.

The assemblage is north striking and steeply dipping. Facing directions, determined by pillow tops, suggest the rocks are gently folded into an anticline although the position of the anticlinal axis has not been found. Fracturing and shearing is observed locally. Two sulphide-bearing fracture sets have been identified on the property. North-trending shears commonly contain quartz carbonate veins and stringers, with local concentrations of chalcopyrite, pyrite and gold.

CURRENT WORK AND RESULTS

In the spring of 1987, BSX 5-10 were recorded by Borealis Exploration Company. During July and August in 1987, regional prospecting, sampling and local detailed mapping concentrated on iron formations, carbonate shears and chalcopyrite- and molybdenite-bearing quartz veins. Reconnaissance geological mapping covered the entire claim group. Gridding, detailed geological mapping and sampling targeted the Molly Prospect at Jawbone Cove and the area southwest of Crown Lake.

Molybdenite in the Jawbone Cove area is commonly confined to the selvedges of smoky quartz veins striking 047° and dipping 55° northwest. Chalcopyrite is concentrated in fractures in the centre of the quartz veins. Eight of 38 grab and chip samples taken from the prospect assayed greater than 100 ppb Au. Assays as high as 1.4 ppm Au, 13.7 ppm Ag, 1.2% Cu and 120 ppm Mo were reported.

Two major iron formations are enclosed by basalts on the Crown Lake grid. The "East zone" is a "pinch and swell" structure up to 8 m wide, consisting of grey chert with pyrite, pyrrhotite and chalcopyrite. The iron formation contains recrystallized white sucrosic quartz lenses with pyrite. Two showings of native copper are in the zone.

The "West zone" is a "dry", sulphide-poor, silicate-oxide-facies iron formation. A sample taken from quartz-carbonate veins within the sheared, carbonate altered hanging wall of the "West zone" iron formation, assayed 7.6 ppm Au and 229 ppm Ag.

Two showings were re-examined during the summer. The Copper Cove trench was sampled. Assays from the samples ranged from 10 to 2400 ppb Au; 1.1 to 62.1 ppm Ag; 940 to 14 100 ppm Cu and 97 to 1825 ppm Ni. Four samples were taken near the trench at the Tern Point Occurrence; all samples contained less than 10 ppb Au.

Three showings were discovered during regional mapping. A unit of iron formation was found in the Water Lake area. The iron formation is 8 to 17 m wide and exposed along strike for 160 m. Facies changes are prevalent and the unit contains sulphide-, sulphide-silicate and local oxide-facies interbedded with volcaniclastic sediments. A second showing, gossanous pillow basalts, was also found in the Water Lake area. Two gossan lenses, approximately 25 m long and up to 5 m wide, are cross-cut by two narrow shear zones. The third zone is an auriferous quartz-carbonate vein, found near the Hamlet of Whale Cove. The vein is 10 to 40 cm in width and exposed for about 25 m. Locally, it contains concentrations of chalcopyrite and minor sulphides. A composite grab sample, taken along strike, assayed 8.0 ppm Au.

PROSPECTING PERMITS 1084, 1085

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 K/11
Calgary, Alta., T2P 0M2	62°30'-62°45'N
	93°00'-93°15'W

REFERENCES

Heywood (1973); Laporte (1987).
DIAND assessment report: 082141.

PROPERTY

Prospecting Permits 1084, 1085.

LOCATION

The permit areas are about 42 km north-northwest of the Hamlet of Whale Cove.

HISTORY

There is no work recorded for the permit areas. An airborne magnetic map was produced by the GSC in 1964. From 1966 to 1967 the area was mapped by Heywood (1973).

Borealis Exploration Ltd. acquired Prospecting Permits 1084 and 1085 in 1986 to cover magnetic anomalies defined by the GSC airborne survey.

DESCRIPTION

The permits cover Archean felsic and mafic lavas, pyroclastics, sediments and sedimentary exhalites, in contact with a belt of layered gneiss and quartz biotite schist. Oxide-facies iron formation are metasediment-hosted beds of massive magnetite, forming banded units 20 cm to 15 m wide. Metamorphic grade is upper greenschist to amphibolite. Extensive drift covers much of the permit areas (Fig. 5-2).

CURRENT WORK AND RESULTS

In 1986, magnetic anomalies identified by the GSC airborne magnetic survey were mapped and sampled. Anomalies were correlated to massive magnetite bands. Nineteen lithogeochemical samples and one pan concentrate sample were taken but failed to yield significant assays. No further work was recommended for the permits.

BANNOCK LAKE SHOWING

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 K/6
Calgary, Alta., T2P 0M2	62°08'-62°24'30"N
	93°15'30"-93°23'W

REFERENCES

Laporte (1976, 1985b).
DIAND assessment report: 082694.

PROPERTY

BSX 1-2 (F14725-F14726).
BSX 3 (F14723).

Borealis Exploration Ltd. acquired BSX 1-4 in late 1986. No work was done on BSX 4.

LOCATION

The claims are 5 km east of Maze Lake and 7 km northwest of Whiterock Lake, approximately 78 km southwest of Rankin Inlet (Fig. 5-2).

HISTORY

The earliest known work in the area was during the 1930s, when quartz veins were prospected. The ground was staked in 1938 by E. Connolly, but no record was found of work on the claims. The first recorded work was performed on Prospecting Permit 17 in 1961 by the Tavane Syndicate, a subsidiary of Rankin Nickel Mines Ltd. At that time, gold was discovered by R. Maloney and P. McLeod in the Bannock Lake area.

In 1970 Husky Oil Ltd. acquired Prospecting Permit 202 covering the Bannock Lake area and flew EM, magnetic and radiometric surveys, followed by prospecting, trenching and ground geophysical and geological surveys. One sample was collected from the Bannock Lake showing, but did not contain gold. The permit expired in April 1973.

In 1973, stakers guided by P. McLeod staked the DEB and EVE claims for D. Hurd. The claims covered the southeastern part of the Bannock Lake showing. Ten trenches were blasted and sampled.

The area was restaked in 1981 as the JA and SC claims. Quartz veins at the showing were sampled and the highest assay obtained was 4.1 ppm Au and 2.0 ppm Ag. The JA claims lapsed in 1983 and the SC claims in 1986.

DESCRIPTION

> The claims cover the northeastern end of a synclinorium of Hurwitz Group Kinga Formation orthoquartzite and the overlying Ameto Formation slate, mudstone and volcanics. These rocks are underlain to the northwest and northeast by Archean mafic volcanics of the Kaminak Group. Metasediments of the Kaminak Group outcrop at the contact between the Archean volcanics and Aphebian orthoquartzite south of Bannock Lake and at the contact between the volcanics and intrusive Archean quartz diorite to granodiorite to the east.
>
> The Kaminak Group metasediments south of Bannock Lake are impure quartzite and grit which grade into conglomerate containing well-rounded granitic boulders up to 76 cm in diameter. The northeast-trending sediments are cut by north-northwest-trending faults, and to the east, are in fault contact with basaltic flows and diorite.
>
> Two gold-bearing zones were outlined [by Maloney and McLeod] in 1961. In Zone 1, a discontinuous quartz vein up to 1.5-m-thick dips 60°E in a poorly developed shear zone in conglomerate. Zone 2, 800 m to the southeast, is a rusty-weathering shear zone trending 60°E in conglomerate, basalt and diorite. A 1.5-m-wide quartz vein dipping 80°E in the shear zone contains gold and, locally, concentrations of sulphides. Samples from the Bannock Lake Showing collected in 1961 contained 132 and 6.5 ppm Au. Grab samples collected from trenches by D. Hurd in 1973 contained tr. to 57 ppm Au. Visible gold was removed from 6 of the 20 samples collected in 1973 before assaying. (Laporte, 1985, p. 161)

CURRENT WORK AND RESULTS

In July and August of 1987, lithogeochemical and pan concentrate samples were collected from the two gold showings and a major northeast-striking shear zone was mapped, prospected and sampled. One showing is 250 m south of Bannock Lake. Sheared boulder conglomerate hosts a quartz vein 0.3 to 1.5 m wide, which is exposed in trenches for a strike length of 200 m. The quartz vein contains up to 10% disseminated and massive pyrite and chalcopyrite and is hematized and carbonatized. The highest lithogeochemical sample assay was 2.7 ppm Au.

The other showing, 1.5 km northeast of the first showing, a quartz vein exposed in two trenches, is developed at the faulted contact of sheared gossanous boulder conglomerate and mafic to intermediate volcanics. Samples of the quartz vein assayed less than 50 ppb Au.

The shear zone was traced for 2.5 km and is a series of en-echelon shears with lenses of less deformed rock. It is locally silicified, carbonatized and sulphide bearing. The highest assay from the shear zone was 0.5 ppm Au.

IGLOO PROJECT

Canadian Nickel Co.	Gold
Copper Cliff, Ont., P0M 1N0	55 K/3,6,7
	62°15'N, 93°00'W

REFERENCES

Laporte (1987).
DIAND assessment reports: 082133, 082179.

PROPERTY

Prospecting Permits 1018, 1019 (55 K/3 N).
Prospecting Permits 1020, 1021 (55 K/7 S).
Prospecting Permit 1073 (55 K/6 SE).
IGLOO 1-14 (F12402-F12415).

LOCATION

The area is centred on a point 100 km southwest and 50 km west of the hamlets of Rankin Inlet and Whale Cove respectively. The permits and claims cover an area bordering on Wilson Bay and Mistake Bay, on the shore of Hudson Bay (Fig. 5-2).

HISTORY

The first recorded exploration work in the area was by Giant Yellowknife Mines Ltd., who held area 55 K/3 as Prospecting Permit 3 from 1961 to 1964 and North Rankin Nickel Mines Ltd., who held areas 55 K/6 and 7 as Prospecting Permits 17 and 18 from 1961 to 1962. Subsequent exploration outlined a number of uneconomic gold and copper showings. Giant Yellowknife Mines Ltd. staked and leased PEN 1-21 and STEIN 1-8, which cover iron deposits northwest of Mistake Bay (within the area covered by Prospecting Permit 1018) and the TORIN claims covering copper-nickel and copper-gold showings on the Ferguson River (just south of Prospecting Permit 1019).

Husky Oil Ltd. acquired Prospecting Permit 202 in 1970 to cover 55 K/6 (Laporte, 1987). Radiometric, electromagnetic and magnetic surveys flown in 1970 were followed up by ground geophysical and geological investigations in 1970 and 1972. No economic concentrations of metals were detected and the permit expired in 1973.

Samples containing anomalous gold were collected from various lithologies during 1981-83 regional reconnaissance sampling by Inco personnel. Most samples were collected from exhalative sulphides and iron formations. Inco applied for Prospecting Permits 1018 and 1021 in 1984 to cover anomalous gold concentrations detected during reconnaissance. Magnetic and EM surveys as well as reconnaissance geological mapping and prospecting were completed in 1984 and 1985. Approximately 33% of the samples taken contained anomalous gold. In the summer of 1985 a till sampling survey outlined a number of anomalies and Prospecting Permit 1073 was acquired.

DESCRIPTION

The permits cover Archean sedimentary and volcanic rocks of the Kaminak Group, unconformably overlain by sedimentary rocks of the Aphebian Hurwitz Group.

Much of the southern portion of Prospecting Permits 1020, 1021 and 1073 and the northern portion of Prospecting Permit 1018 is underlain by Kaminak Group sediments. Argillite, impure sandstone and greywacke outcrop on the north shore of Mistake Bay and on both shores of Wilson Bay. Within much of the sequence, bedding is thin and indistinct. Conglomerate is found locally. Granitic clasts form 75% of the rock and volcanic clasts the remainder.

The sediments enclose widely distributed arcuate layers of Algoman-type magnetite iron formation up to 60 m thick. Alternating layers of magnetite and quartz from 0.3 to 30 cm in thickness are interbedded with chert, jasper, or slate beds up to 1.3 m thick, forming thin, laterally extensive layers. Sulphide and carbonate facies layers are rare.

In the southwest portion of Prospecting Permit 1018 and in 1019 the sediments are underlain by basalts and andesites. Primary textures such as pillows, amygdules and feldspar phenocrysts are preserved locally in the mafic volcanics. Dacites, rhyolite, quartz porphyry, quartz-feldspar porphyries and felsic pyroclastics (predominantly ash flows) are found within the volcanic assemblage.

Orthoquartzites, impure quartzites, greywacke, conglomerate and dolomite of the Aphebian Hurwitz Group are exposed in the northwest corner of Prospecting Permit 1019, in a synclinal northeast-trending trough and in Prospecting Permits 1073 and 1021 as discontinuous east-trending outliers.

The sediments and volcanics form a northeasterly facing homoclinal sequence intruded in the north and the west by quartz diorite, granodiorite and quartz monzonite plutons. Synvolcanic intrusions including peridotite, gabbro and diorite sills and plugs and quartz-feldspar porphyry dykes cut the permit areas. Two diorite-gabbro plugs host auriferous shears. Iron carbonate alteration, silicification, fuchsite and arsenopyrite are found predominantly within the volcanic rocks. Iron carbonate is found both as veins and disseminations within various lithologies. Disseminated or vein arsenopyrite is found throughout the permits and is associated with elevated gold. Silicification is rare and usually associated with gold. Fuchsite is also rare.

CURRENT WORK AND RESULTS

In 1986, IGLOO 1-14 were staked. IGLOO 1-3 were staked to cover IP anomalies in the area of the Wilson Bay plug. IGLOO 4-10 and 11-13 were staked within Prospecting Permits 1019 and 1020 respectively.

Exploration in the summer of 1986 included reconnaissance and detailed mapping, gridding and detailed geophysical surveys. During reconnaissance mapping, an arsenopyrite-bearing felsic dyke, 15 m wide with a strike length of more than 200 m, was discovered. IGLOO 14 was staked to cover the dyke.

Targets for grid controlled detailed mapping were shear and alteration zones within two diorite-gabbro plugs and a folded iron formation. The diorite-gabbro plugs are on the north shore of Big Lake and the north shore of Wilson Bay (Fig. 5-2). Shear zones within the plugs are characterized by quartz and iron carbonate flooding and up to 10% pyrite and arsenopyrite. Alteration zones reach 10 m in thickness and several tens of metres in length. A fuchsite-bearing sample from one shear zone assayed 25.5 ppm Au.

The Whiterock iron formation is approximately 1 km north of the Wilson River, between Whiterock Lake and Wilson Bay. Banded oxide-facies iron formation within greywackes defines a fold opening to the east. Pyrite is in both the iron formation and the enclosing sediments, and samples taken from pyritic sections assayed up to 4.2 ppm Au.

Magnetometer and EM surveys were performed over the iron formation and the Big Lake plug, a VLF survey was performed over the Big Lake plug and IP surveys were conducted over both plugs. The surveys detected a number of anomalies and conductors.

In 1987, 263 m of diamond drilling was completed in 18 holes. Two phases of drilling at the Wilson Bay plug consisted of 124 m in five holes and three follow-up holes. The first target was a hematized, silicified zone over an area 100 by 150 m at the northeast margin of the plug where up to 10% arsenopyrite and pyrite were observed locally. Six holes were collared in the gabbro to test the zone along a strike length of 300 m. Drill results suggest that the gabbro contact dips approximately 60° to the south. Quartz diorite and sediments were intersected beyond the gabbro contact. All rock types have been sheared and brecciated and all, in places, host gold. A zone 5.1 to 6.45 m in width, with a minimum strike length of 100 m, was intersected in three holes and samples assayed 6.62 ppm over 5.16 m, 4.84 ppm over 6.45 m and 1.96 ppm over 5.10 m.

An IP response immediately south of the first target area was drilled. An intersection of quartz diorite with arsenopyrite provided an assay of 2.65 ppm Au over 6.6 m. The final drill target, an assumed north-trending fault zone on the west side of the main zone, yielded an intersection of 7.87 ppm Au over 1.5 m.

At Big Lake, 10 holes totalling 1386.24 m were drilled. Six holes were designed to test a northeasterly trending shear zone, 1 to 3 m in width and 500 m long. Auriferous zones were less than 1.5 m in apparent width and intersections assayed 2.23 ppm to 15.7 ppm Au. Four other holes tested separate targets in the area. Three targets, an auriferous chert bed, an EM conductor and an altered shear zone, did not provide significant intersections. A 1.5 m intersection from an IP target assayed up to 12.4 ppm Au.

During 1987, geological mapping and channel sampling was carried out on IGLOO 1, 2, 9 and 10. Visible gold was found at four separate areas on IGLOO 9 and 10 (the Big Lake plug) and channel samples assayed as high as 52.7 ppm Au over a 1.2 m interval.

Geological surveys were carried out over the southwestern portion of Prospecting Permit 1073 and previously unmapped areas of the Whiterock Iron Formation. A magnetometer survey completed coverage of the Whiterock grid.

Sampling was carried out on IGLOO 6 and 13. Samples collected along a granodiorite/basalt contact provided two assays greater then 1 ppm Au, a gossan sample yielded 8.18 ppm Au and a gossan within a shear zone yielded 7.32 ppm Au.

KEEWATIN GOLD PROJECT AND FAT LAKE DEPOSIT

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 K/3,4, L/1
Calgary, Alta., T2P 0M2	62°00'-62°15'N
	93°15'-94°30'W

REFERENCES

Cadiz (1989); Davidson (1970); Heywood (1973); Laporte (1987); Padgham (1985).

DIAND assessment reports: 082138, 082140, 082676, 082788, 082809, 082824.

Mineral Inventory File 55 K/4, Au 3.

PROPERTY

SUSAN, SUSAN 2-3 (F12136-F12138).

Prospecting Permits 1070, 1079, 1080, 1081, 1100, 1101, 1102.

AIRSTRIP 1 (F11733).

LOCATION

The permit areas extend from Nevill Bay, approximately 42 km west-southwest of the Hamlet of Whale Cove, to Southern Lake, 4 km southeast of Quartzite Lake (Fig. 5-4). The SUSAN and AIRSTRIP claims are between Prospecting Permits 1070 and 1081.

HISTORY

The Last Lake area was first examined by Hudson Bay Mining and Smelting Company Ltd. during the late 1940s. A gold showing in the north portion of Prospecting Permit 1081 was trenched, but the results were not reported. In the late 1950s Newmont Mining Corporation of Canada staked the GUN claims over a copper showing west of Last Lake. Tavane Syndicate flew a magnetometer/EM survey over the southern permit areas in 1959.

Giant Yellowknife Mines flew a regional magnetometer/EM survey, covering the area of the current permits, in 1960. Ground follow up included the examination of the copper showing on the GUN claims and a gold showing in the north portion of Prospecting Permit 1081. Three conductors were trenched and subsequently drilled (TORIN Group). Drilling was abandoned when uneconomic grades of copper and nickel were intersected. Several iron prospects were drilled and the core was assayed for iron only.

Husky Oil Ltd. explored throughout the area from 1970 to 1973. Airborne radiometric, magnetic and EM surveys were done in 1970 and followed up by prospecting and ground geophysical surveys. One anomaly corresponds to a sulphide showing at Gun Lake covered by Prospecting Permit 1070. Samples from three quartz veins north of the anomaly assayed 13 ppm Ag, 0.23% Cu, 0.007% Ni, 0.102% Pb and 0.018% Zn. The REP claims were staked southeast of Last Lake. The

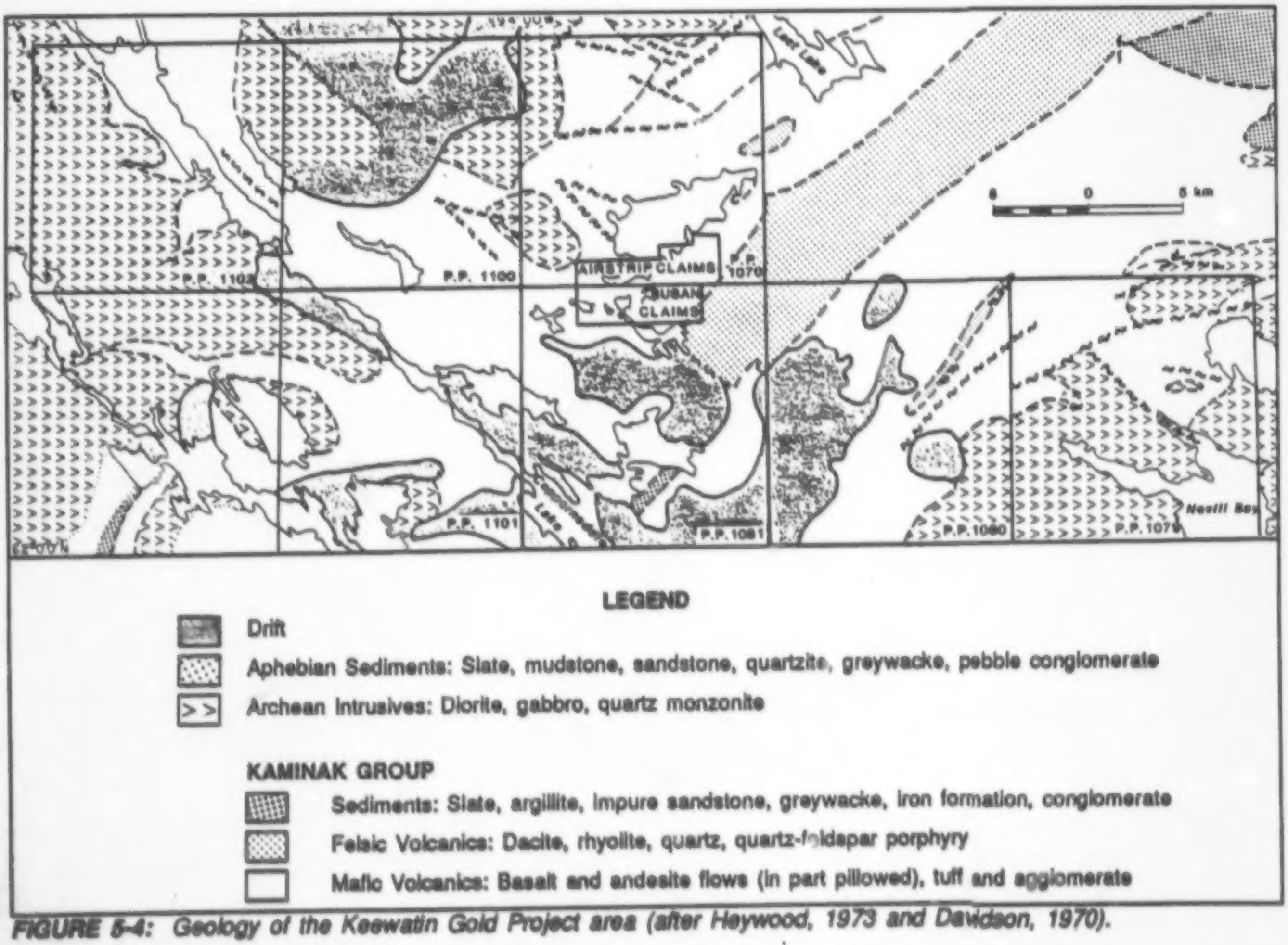

Last Lake
5
0
5 km
AIRSTRIP CLAIMS
SUSAN CLAIMS
P.P. 1102
P.P. 1100
P.P. 1070
P.P. 1101
P.P. 1081
P.P. 1080
P.P. 1079
Nevill Bay
LEGEND
Drift
Aphebian Sediments: Slate, mudstone, sandstone, quartzite, greywacke, pebble conglomerate
Archean Intrusives: Diorite, gabbro, quartz monzonite
KAMINAK GROUP
Sediments: Slate, argillite, impure sandstone, greywacke, iron formation, conglomerate
Felsic Volcanics: Dacite, rhyolite, quartz, quartz-feldspar porphyry
Mafic Volcanics: Basalt and andesite flows (in part pillowed), tuff and agglomerate

FIGURE 5-4: Geology of the Keewatin Gold Project area (after Heywood, 1973 and Davidson, 1970).

claims covered a showing of quartz-carbonate veins 6 to 150 m in strike length and 0.3 to 0.9 m wide, injected into a carbonatized zone developed in sheared andesite. Thirty pits and trenches were blasted; two quartz samples contained 17 ppm and 84 ppm Au.

The showing was restaked as the IT claims and optioned to Denison Mines Ltd. and Coniagas Mines Ltd. in 1973. The showing was mapped and sampled and the best assay was 48 ppm Au. The claims lapsed. The longitude and latitude for the showing were incorrectly recorded on the National Mineral Inventory Card, 55 K/4 Au 4; as a result the showing was "lost" for several years (Padgham, DIAND Property Examination).

In 1985 Borealis began acquiring land throughout the Rankin-Ennadai belt. Permit 1070 was acquired in January 1985 to cover the REP showing. The SUSAN claims were added to the land holdings in the summer of 1985. Prospecting Permit 1070 and the SUSAN claims were prospected during the summer of 1985. A grid was established and magnetometer, Max-Min, geological and lithogeochemical surveys were completed. Quartz-veined shear zones contain up to 500 ppm Au.

DESCRIPTION

Archean basement rocks of the permit areas are felsic and mafic lavas, pyroclastics, immature clastic sediments and sedimentary exhalites of the Kaminak Group. Volcanic rocks range in composition from basalt to rhyolite, with andesite predominating. Carbonate-, silicate- and sulphide-facies banded iron formation is associated with argillites and shales. The assemblage is intruded by gabbro and quartz-diorite sills and dykes and quartz-feldspar porphyry dykes. Southeast- and southwest-trending faults cut the area. A small diorite plug has intruded along the "Doodle Lake Fault", a southwest-trending fault that transects Prospecting Permits 1079 and 1080. Gold is associated with zones of shearing, iron formations and quartz vein systems.

At the Fat Lake deposit on the SUSAN claims, gold forms blebs and disseminations within quartz-carbonate veins, hosted by a steeply dipping diorite sill. The northern contact of the sill is sheared but in most places the southern contact of the sill is distinct. The sill is bounded by a series of sinistral northeast-trending sulphide-bearing shears. Quartz veins, in places anastomosing, boudinaged, brecciated, layered, folded and transposed, commonly contain calcite, chlorite, pyrite, pyrrhotite, chalcopyrite, galena, sphalerite, arsenopyrite, gold and locally fuchsite, sphalerite and galena associated with visible gold and minor silver.

CURRENT WORK AND RESULTS

Permits 1079, 1080, 1081, 1100, 1101, 1102 were acquired in 1986. During 1986, mapping in the permit areas concentrated on the showings. Showings were sampled and mapping surveys were expanded to trace anomalies. Lithogeochemical and pan concentrate samples were taken and the significant showings were trenched. Limited diamond drilling tested one of the showings on Prospecting Permit 1081. No economically significant mineral concentrations were found within Prospecting Permits 1100 and 1102.

On Prospecting Permit 1070, three trenches were excavated on a conductor formerly covered by the GUN claims. The conductor is attributed to a major zone of shearing within tuffaceous andesites. The west-southwest-trending shear is exposed over a strike length of 55 m and ranges from 1 to 5 m thick. The shear contains up to 10% pyrite and/or pyrrhotite with minor arsenopyrite and magnetite and is cross-cut by west-northwest-trending quartz-feldspar porphyry dykes. Three 45 kg bulk samples taken from the trenches did not contain economic gold concentrations.

Within Prospecting Permit 1081 in the Talc Lake area, a series of silicified, carbonatized shear zones were found to host gold-bearing quartz-carbonate veins. The veins were tested by 83.1 m of diamond drilling in four holes. Core samples contain gold including a 0.5 m intersection of 27 ppm Au.

An iron formation, traced along a strike length of approximately 2.5 km, parallels the Doodle Lake Fault approximately 1 km to the south. Silicate facies in the north changes laterally to carbonate facies over a strike length of 100 m. Small bands of sulphide-facies iron formation, with up to 25% combined pyrite, arsenopyrite and pyrrhotite, are contained within the carbonate facies unit. An anastomosing shear, associated with the iron formation, was traced for a strike length of approximately 2 km. The shear is locally phyllitic and strongly silicified. When observed near the iron formation, it contains up to 20% combined pyrite, chalcopyrite and arsenopyrite. Detailed grid work was carried out at four locales along the iron formation/shear trend and samples were anomalous in gold.

Further geological mapping, plus rock and pan concentrate sampling was undertaken on Prospecting Permits 1081 and 1070 during 1987. On Prospecting Permit 1081, six showings were examined, including oxide-facies iron formation, zones of gossan and carbonatization and shear zones. Gold assays in excess of 100 ppb were yielded by a pyrite-bearing quartz vein and a quartz-feldspar porphyry dyke with pyrite-bearing quartz-carbonate cross-cutting veins. On Prospecting Permit 1070, two quartz veins from the North zone were sampled. The samples yielded 15.5 and 3.3 ppm Au.

SUSAN Claims/Fat Lake Deposit:

In 1986, 46 km of gridding established an east-northeast-trending grid on the east shore of Fat Lake and a northeast-trending grid southeast of "Diorite Lake". Detailed exploration consisted of mapping, prospecting, trenching, magnetometer, VLF EM, MAXMIN and HLEM surveys. Six holes totalling 593 m were drilled to test an EM conductor under Fat Lake and two holes totalling 178 m were drilled to test conductors and fault zones in the Diorite Lake area (North zone).

Subsequent surface sampling and trenching delineated three high-grade gold-bearing zones which were then drilled. At the North zone, 18 holes, totalling 643 m outlined a quartz-carbonate-flooded shear zone, 835 m in strike length. The zone hosts erratic concentrations of gold and plunges sub-vertically to the northeast. A total of 1586 m of drilling in 45 holes confirmed the continuity the gold-bearing zone at depth at the Fat Lake showing. Intersections, 1.0 to 15.0 m in drilled width, of 1.7 to 7.5 ppm Au, were recovered from 304 m of drilling in eight holes in the South Gossan zone.

In 1987, continued exploration on the SUSAN claims and surrounding areas consisted of further gridding, mapping, trenching, channel sampling, magnetometer, VLF EM and MaxMin HLEM surveys. Interpretation of geophysical surveys linked the EM conductor in Fat Lake and the North zone. Results from spring drilling on the Fat Lake Diorite (8 holes, 668 m) resulted in the decision to initiate underground exploration and bulk sampling. A mine grid was established and detailed mapping and channel sampling of quartz veins was done in the area of the mine site. A 70 m decline shaft was excavated during August to access the -20 m level and 75 m of drifting north and south of the decline was completed to evaluate Vein 101 (Fig. 5-5). A pilot scale 100 tpd test mill operated for three days to process 150 t of ore from Vein 101.

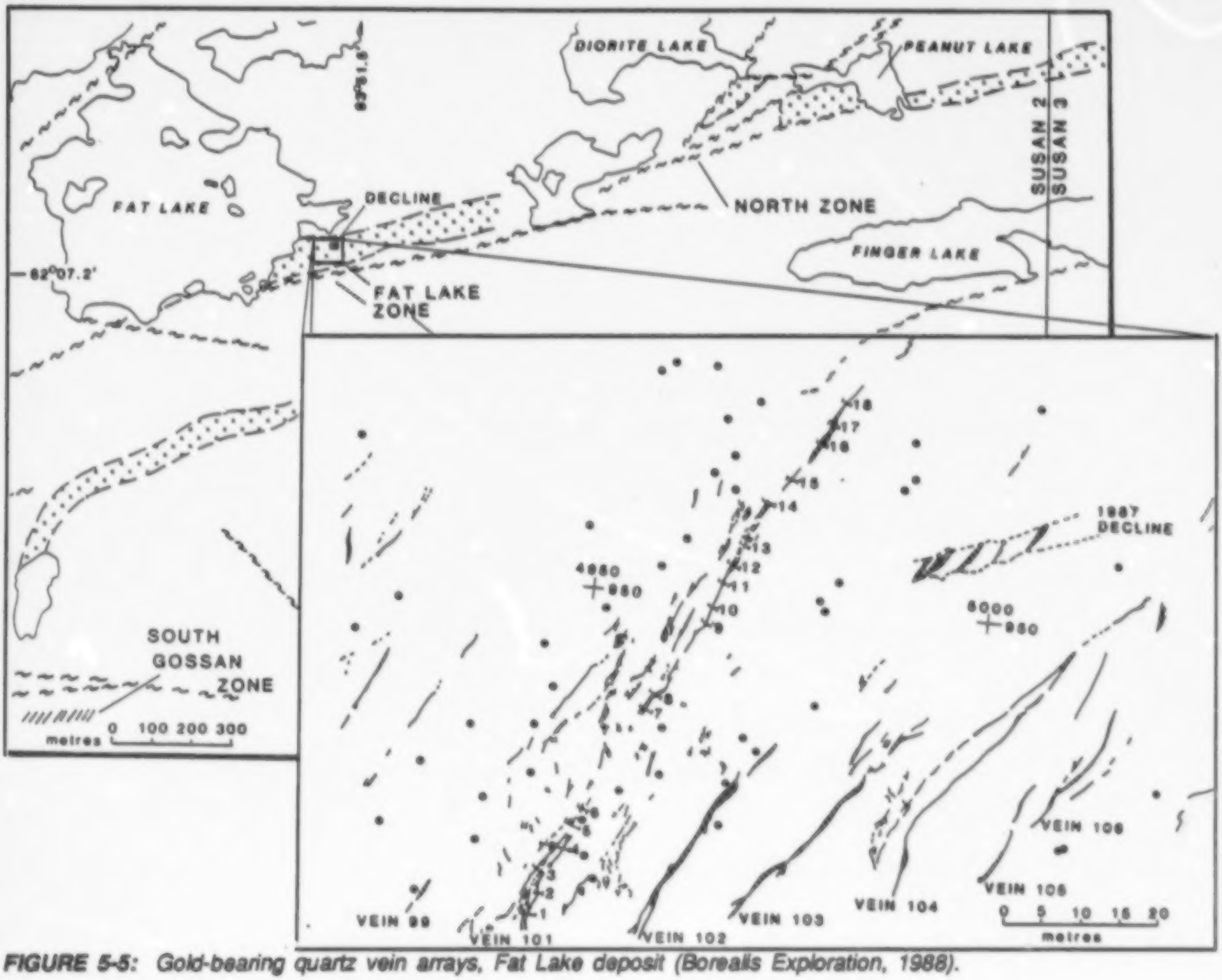

DIORITE LAKE
PEANUT LAKE
93°51.0'
SUSAN 2
SUSAN 3
FAT LAKE
DECLINE
NORTH ZONE
FINGER LAKE
62°07.2'
FAT LAKE ZONE
SOUTH GOSSAN ZONE
0 100 200 300
metres
18
17
16
15
14
13
12
11
10
4950
+950
1987 DECLINE
5000
+950
VEIN 106
VEIN 105
VEIN 104
VEIN 103
VEIN 102
VEIN 101
VEIN 99
0 5 10 15 20
metres

FIGURE 5-5: Gold-bearing quartz vein arrays, Fat Lake deposit (Borealis Exploration, 1988).

Drilling continued in the fall with 25 holes totalling 1270 m targeting Veins 99 to 103 and veins east and west of the decline shaft, a single 112 m hole undercutting a previous hole in North zone and 10 holes totalling 648 m to further evaluate the South Gossan showing. More high-grade veins were identified in the mine area and a 1.10 m intersection of 490 ppm Au was obtained.

HAPPY LAKE PROJECT

Noble Peak Resources Ltd.
4th Floor, 2338 Hurontario St.
Mississauga, Ont., L5B 1N1

Gold
55 L/7,9,10
62°22'-62°37'N,
94°22'-95°00'W

REFERENCES

Davidson (1970); Laporte (1974a); Shilts (1973); Wright (1967).

DIAND assessment reports: 082113, 082544, 082565, 082584, 082703, 082736.

PROPERTY

HAPPY 1-4 (F10115-F10118).
HAPPY 5-6 (F13654-F13655).
HAPPY 7 (F14774).
HAPPY 8 (F14792).
NORM 1-8 (F13657-F13664).
Prospecting Permit 1110 (55 L/7 NW).
Prospecting Permit 1086 (55 L/10 SE).

LOCATION

The Happy Lake project area is north of Happotiyik Lake, approximately 130 km west-southwest of Rankin Inlet and 110 km west-northwest of Whale Cove.

HISTORY

The area was mapped by the GSC in 1952 (Wright, 1967) and again in 1966 (Davidson, 1970).

Between 1949 and 1975 the area of Prospecting Permit 1110 was the focus of intermittent exploration. In 1949 Kasba

LEGEND

▨ Intrusive diorite Complex

☐ Mafic Volcanics

≡ Shear Zone

Quartz Veins

● Drill Collar Locations

⊢⊣ Channel Sample Locations

4850 + 950 Mine Grid Coordinates

Vein 101 Channel Sampling Results:

Channel	ppm Au	Sample length(cm)
1.	3.84	20
	4.87	15
	0.30	15
	98.74	8
	0.49	20
2.	2.34	20
	148.80	20
	0.31	15
	12.96	22
	98.74	8
	0.49	20
3.	0.04	18
	28.29	20
	4.39	20
	1.30	20
	0.24	20
	1.13	20
	8.78	13
	6.00	7
	0.37	18
4.	2.88	18
	198.86	22
	23.73	20
	61.71	22
	40.46	22
	0.47	20
5.	10.97	22
	10.29	22
6.	1.23	20
	2.85	30
	0.47	20
7.	0.15	30
	40.11	10
	0.37	38
8.	0.42	30
	45.60	30
	0.31	22
9.	0.65	20
	2.09	20
	0.31	28
10.	0.22	18
	55.20	14
	0.13	24
11.	0.53	60
	5.04	25
	0.26	15
12.	0.25	18
	9.05	13
	2.43	19
13.	0.13	18
	2.50	30
	0.99	22
14.	2.64	16
	17.52	34
	5.55	30
	9.50	10
	3.09	10
15.	1.85	18
	54.17	20
	2.09	18
16.	0.42	15
	3.36	15
	4.29	48
	0.29	10
17.	0.97	34
	8.30	35
	5.59	16
18.	0.10	22
	43.20	13
	1.82	17

Exploration Ltd. examined the gold potential of the belt between Quartzite Lake and Padlei Lake. Several gold showings were found, but none warranting staking. In 1961 Giant Yellowknife Mines conducted extensive helicopter supported regional exploration. The PETER claims were staked immediately south of the permit area, some trenching was carried out and 12 holes totalling 1580 m were diamond drilled. Gold content in core was 340 ppb to 680 ppb. Further regional exploration was carried out between 1969 and 1975. Between 1969 and 1971, Penarroya Canada Ltee., in joint venture with Serem Ltee, Rexomines Ltd. and Aquitaine of Canada Ltd., conducted Mission Keewatin, a program of airborne EM and magnetometer surveys followed by ground surveys. Between 1973 and 1975 Noranda Exploration Co. Ltd. carried out the Yandle-Kaminak Project, a regional base metals exploration program. In 1975 U.S. Steel Western Hemisphere Inc. contracted Precambrian Mining Services Ltd. to stake claims and conduct geological, geochemical, EM and magnetometer surveys in the area of anomalies detected during the Penarroya airborne survey.

In 1969, independent prospectors J. Kilgour and P.M. Reid staked the KIR claims on the north shore of Happotiyik Lake, in an area corresponding to Prospecting Permit 1086 and HAPPY 1 and 6. The claims were prospected in 1969 and in 1970, a number of small grids were established and four gold-bearing zones were trenched. Channel samples yielded up to 7 ppm Au over 5 m and 12 ppm Au over 2.3 m. One grab sample assayed 78 ppm Au. The claims were allowed to lapse in 1971.

In 1970 and 1971, the GSC carried out drift prospecting and geochemical sampling in the Kaminak Lake area. Anomalous copper and nickel concentrations were detected.

DESCRIPTION

The claims, Prospecting Permit 1086 and the southwest portion of Prospecting Permit 1110 are underlain by Archean mafic to intermediate massive and pillowed flows and felsic pyroclastics of the Kaminak Group. Pyroclastics range in texture from fine-grained tuffs to agglomerates. Interflow sediments form argillaceous, cherty or carbonate-rich bands within fine-grained tuffs. The assemblage forms a northeast-trending belt.

Archean granodiorite occupies the northwest corner of the claim group and eastern portion on Prospecting Permit 1086 and forms a northeast-trending band across the central area. Hornblende gabbro and metagabbro has intruded between the granodiorite bodies and forms a stock in the southeast corner of the claims. Archean intrusions ranging in composition from granodiorite to tonalite and gabbro to diorite predominate throughout Prospecting Permit 1110 and extend into the southwest portion of Prospecting Permit 1086 and the eastern portion of the NORM claims.

Both the intrusions and supracrustal rocks have been locally sheared sub-parallel to stratigraphy. Shearing is commonly accompanied by silicification, sulphide and iron carbonate enrichment and anomalous gold content.

Northeast- and northwest-trending faults are regional in scale and east-trending faults local. Local small scale folding is found near intrusions. Metamorphic grade increases from south to north, from greenschist to amphibolite facies.

Quartzites and dolomitic stromatolite mounds of the Hurwitz Group are in fault bounded contact, or local unconformably on-lapping contact with Archean rocks and form a southwest-trending band in the southeast of Prospecting Permit 1110 and across the NORM claims.

CURRENT WORK AND RESULTS

Noble Peak Resources Ltd. acquired Prospecting Permits 1110 and 1086 in 1986. HAPPY 1-4 were staked in the spring of 1986. HAPPY 5 and 6 were added to the group in late summer and HAPPY 7 and 8 in the late summer of 1987.

Within the HAPPY claim group, reconnaissance geological mapping, prospecting and sampling during the 1986 and 1987 field seasons identified five showings that were targeted for detailed work (Fig. 5-6). Grids were established over each showing during the 1987 field season and detailed geological mapping in conjunction with rock-chip sampling was carried out on each grid.

The "Tuktu" and "Rabbit" prospects are within an east-northeast-trending volcanic belt that has been intruded by mafic sills and "squeezed" between two granodiorite intrusions. The rocks display gossans, have been sheared and silicified and host anomalous concentrations of gold. The Tuktu gossan is within interflow sediments between mafic volcanics and a gabbro sill. A magnetometer and VLF survey was conducted over the Tuktu grid to aid in geological interpretation. Samples from a "C" horizon soil survey contained less than 10 ppb. However one assay of 3 ppm Au came from an area over a sheared gossan-bearing gabbro sill and corresponded to an assay of 1300 ppb Au from a bedrock sample at the same location. A total of 694.0 m of diamond drilling in six holes tested the main Tuktu gossan which yielded up to 538 ppb Au. Soil samples collected on the "Rabbit" grid yielded 4 to 1100 ppb Au.

The "Weasel" and "Slide" prospects are at, or adjacent to, a contact between mafic volcanic flows and felsic pyroclastics. Shearing sub-parallel to the contact exhibits silicification and iron carbonate enrichment. A total of 1218 m in six diamond-drill holes were drilled on the Weasel Prospect. A high assay of 35 ppm Au was obtained from a 1 m core sample of a silicified shear zone.

The "Strand Creek" prospect is an area of sheared gossanous rocks. Shear zones are locally sulphide enriched.

In 1987, preliminary reconnaissance mapping, prospecting and chip sampling was directed toward the portion (approximately 25%) of Prospecting Permit 1110 that covers Kaminak Group rocks. Gossans are associated with intermediate tuffs in the south and in the north, within tuffaceous rafts included in a wide gradational contact zone between a tonalite intrusion and volcanics. Chip samples were taken of gossans and other areas of alteration, particularly zones of silicification and carbonatization and sulphide enrichment. Average gold content was 10 to 14 ppb. The highest gold assay (3.6 ppm) was associated with anomalous silver, copper and zinc and was obtained from a small gossan within tonalite. A quartz vein sample containing pyrite and chalcopyrite yielded 0.29% Cu.

From 1986 to 1987, prospecting, followed up by gridding, detailed mapping, rock and "C" horizon soil sampling, magnetic and VLF surveys and diamond drilling was carried out in Prospecting Permit 1086. During the 1986 field season eleven gold and base metals showings were found, including the four zones trenched and pitted by Kilgour and Reid in 1970. A 38.2 km grid with 100 m line spacing was established over ten of the showings. The grid area is underlain by north-northeast-trending, near vertically dipping, massive and pillowed basalts interbedded with intermediate tuffs. Argillaceous or cherty chemical sediments are interlayered within the tuff units. Quartz veining is observed throughout the grid area. Two ages of quartz veining were identified; the older set hosts gold.

The zones are sulphide-rich recrystallized quartz veins flanked by gossanous chemical sediments which commonly exhibit fuchsite, chlorite and sericite alteration as well as pyrite, chalcopyrite, pyrrhotite, sphalerite and arsenopyrite. The veins are usually parallel or sub-parallel to bedding and the zones are pervasively sheared. The zones range from 1 to 7 m in width and have been traced for strike lengths in excess of 1 km. Of the 241 samples taken from the grid, 123 assayed greater than 100 ppb Au. The highest assay results were 105 ppm Au for a composite grab, 140 ppm Au across 0.25 m and 5 ppm Au across 7 m. Anomalous amounts of zinc, copper and silver were indicated.

The VLF EM survey over the grid defined two major northwest-trending conductors cross-cutting or flanking sulphidic zones and a weak west-northwest-trending, curvilinear conductor that cross-cuts, at an acute angle, two parallel zones of sulphidic chemical sediments and recrystallized quartz veins.

In 1987, the grid area was extended, magnetic and VLF surveys were completed on the new gridded area and further geochemical sampling was undertaken. A total of 8721 m of diamond drilling in 95 holes tested the 10 zones within the grid area. Drill results suggest that three of the zones form part of the same unit, with a strike length of 1.7 km. Up to 14 ppm Au over 8.0 m core length was intersected within the zones. Gold in four other zones proved to be erratic and discontinuous. The remaining zones were recommended for limited follow-up work to complete evaluation.

In 1987, reconnaissance work outside the grid area outlined a showing of quartz, iron carbonate and carbonate altered shears with 1-3% disseminated pyrite. Assays of up to 13 ppm Au were obtained from chip samples.

A combined magnetic/AEM/VLF survey was flown by Aerodat Ltd., under the direction of MPH Consulting Ltd., in August, 1987. The survey covered 1075 line-km over portions of Permit 1086 and the adjoining NORM and HAPPY claims. The surveys identified 31 AEM conductive zones. A preliminary ground check of anomalies determined that the conductors were sulphide-rich bands within volcanic tuffs and flows.

PROSPECTING PERMITS 1082 & 1083

Borealis Exploration Ltd.	Gold
960, 540 5th Ave. SW	55 L/6 SE, SW
Calgary, Alta. T2P 0M2	62°15'-62°22'30"N
	95°00'-95°30'W

REFERENCES

Davidson (1970).
DIAND assessment reports: 082139, 082675.

PROPERTY

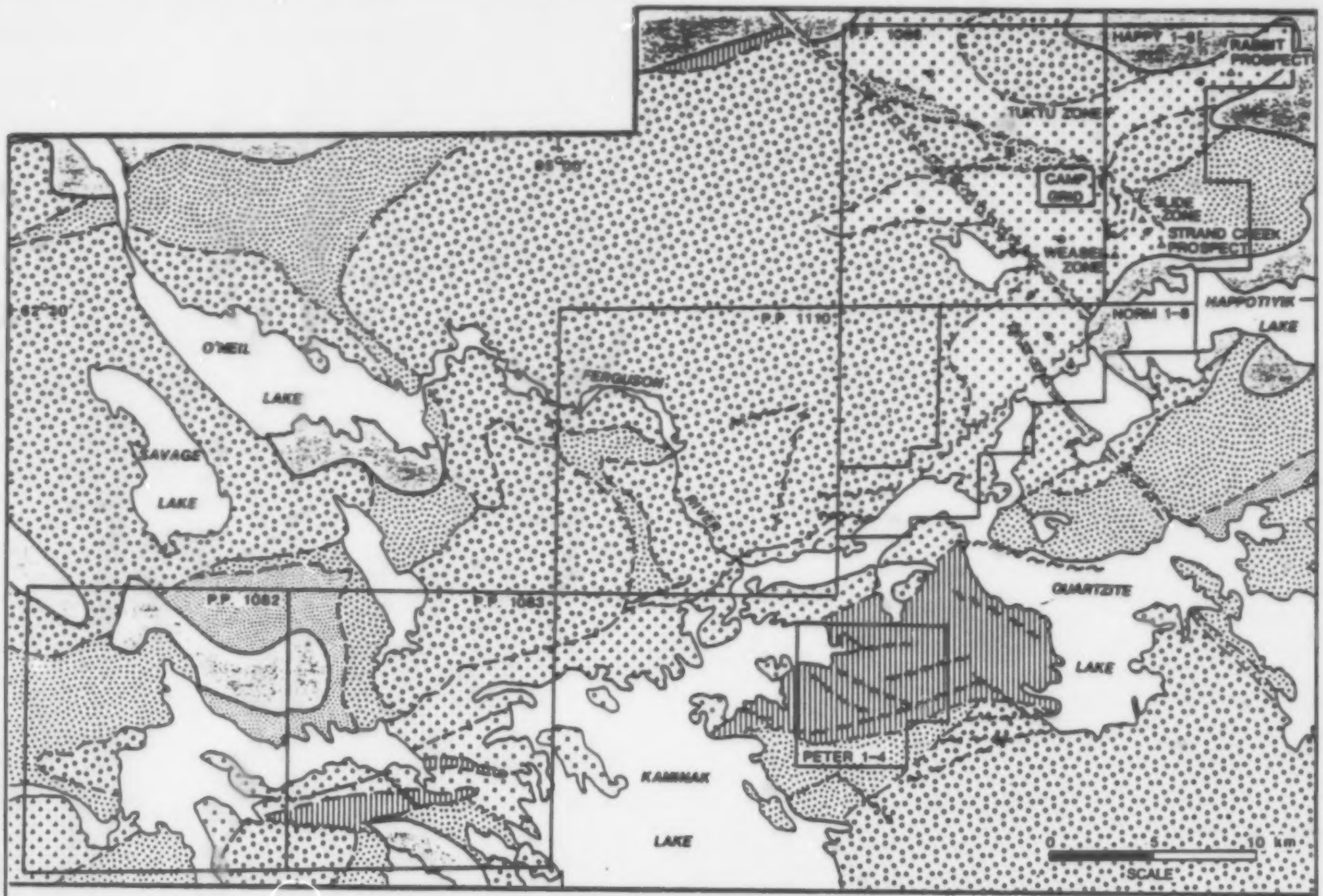
Prospecting Permits 1082, 1083.

LOCATION

The permits are approximately 126 km west of the Hamlet of Whale Cove, on the north shore of Kaminak Lake.

HISTORY

The first reporded work in the area was by Kasba Exploration Ltd. in 1949. Prospecting between Quartzite and Padlei lakes resulted in a number of gold showings being found, although none were staked.


P.P. 1066
HAPPY 1-8
RABBIT PROSPECT
TUKTU ZONE
CAMP GRID
SLIDE ZONE
STRAND CREEK PROSPECT
WEASEL ZONE
NORM 1-8
HAPPOTIYIK LAKE
95°00'
62°30'
O'NEIL LAKE
SAVAGE LAKE
P.P. 1110
FERGUSON RIVER
P.P. 1082
P.P. 1083
QUARTZITE LAKE
PETER 1-4
KAMINAK LAKE
0 5 10 km
SCALE

▨ Glacial Drift

▨ HELIKIAN DIABASE: Diabase, quartz diabase

▨ HURWITZ GROUP: Orthoquartzite, greywacke, siltstone, slate, conglomerate and andesite

▨ ARCHEAN INTRUSIVE ROCKS: Hornblende tonalite, hornblende gabbro diorite ± inclusion of amphibolite

KAMINAK GROUP

▨ SEDIMENTS: Greywacke and slate, minor tuff, volcaniclastic pebble conglomerate, iron formation, pelitic schist

▥ FELSIC VOLCANICS: Felsic tuff, agglomerate, flow breccia, associated felsic intrusions

▨ MAFIC VOLCANICS: Massive or pillowed basalts and andesites, hornblende schists and amphibolite

▨ UNDIFFERENTIATED FELSIC AND MAFIC VOLCANICS: can include mafic flows with intercalated felsic flows and tuffs

~~~~ Shears or fault zones

FIGURE 5-6: Geology and properties of the Kaminak Lake area (after Davidson, 1970).
~~~~

In 1961, during extensive regional exploration, Giant Yellowknife Mines Ltd. found a pyrite showing in the Dagwin Lake area. AEM conductors in the area were prospected and attributed to graphite with low copper or gold content. A number of quartz veins on the west shore of Kaminak Lake were examined, trenched and drilled.

Pennaroya Ltee carried out regional exploration from 1969 to 1971. An area on the north shore of Kaminak Lake within the current permit area was examined, but no results were reported.

Republic Resources Ltd. conducted an airborne scintillometer survey over the area in 1971. Ground follow up outlined four geochemical anomalies in the area of Kaminak Lake. A sample from within the current permit area yielded 0.68 ppm Au. Two showings south of O'Neil Lake, to the west of Kaminak Lake, were diamond drilled. The best intersection yielded 10.28 ppm Au over 30 cm.

In 1975, Noranda Exploration and United States Steel Corporation were active in the area. Noranda conducted airborne and ground EM and magnetometer surveys. Two conductors were defined and the one south of Kaminak Lake was drilled. No gold assays were reported. United States Steel Corporation followed up on anomalies defined by Pennaroya's airborne surveys. Anomalies on the north shore of Kaminak Lake were sampled. Two samples were anomalous in gold.

In 1985 Borealis Exploration Ltd. began the Keewatin Gold Project to evaluate gold showings in the Rankin-Ennadai belt.

DESCRIPTION

A downfaulted synclinal trough of Aphebian Hurwitz Group, massive to pillowed andesites, orthoquartzite, conglomerate, greywacke, siltstone and impure quartzites transect the permit areas. Hurwitz Group rocks lie unconformably on Archean rocks of the Kaminak Group. The basal contact of the Hurwitz Group is typically sheared.

In this area, the Kaminak Group comprises massive and pillowed basalts and andesites, with synvolcanic intrusions, mafic flows with intercalated felsic flows, felsic tuffs with intercalated sediments and greywacke, slates, volcaniclastics and iron formation. The rocks are intruded in the south and northeast by Archean tonalite. The centre of the permit area is covered with Quaternary till deposits (Fig. 5-6).

A number of west- and northwest-trending faults were noted on the south limb of the synclinal trough. Regional metamorphism in the permit area is greenschist facies, passing to lower amphibolite facies in the north.

CURRENT WORK AND RESULTS

Prospecting permits 1082 and 1083 were acquired in 1986. During the 1986 and 1987 field seasons, geological mapping and rock and pan concentrate sampling were carried out. Mapping was concentrated around showings. Within Prospecting Permit 1082, a series of rhyolite dykes trending 070°, 3 to 5 m wide with strike lengths of up to several hundred metres, contain trace to 1% disseminated pyrite. Contact zones are 1 to 2 m in width and exhibit sericite alteration, silicification and up to 50% pyrite, pyrrhotite and arsenopyrite. Quartz veins, 1 to 60 cm in width, are associated with the dykes in "ladder" style orientation. The veins can be traced for up to several hundred metres and locally contain pyrite, chalcopyrite, galena, arsenopyrite and malachite. Of the 34 samples taken from the contact zone and quartz veins, only 12 assayed less than 25 ppb Au. Assays for the intrusive suite ranged from 25 ppb Au to 750 ppm Au. One grain of visible gold was noted in a pan concentrate sample. Further sampling of the same quartz vein system in 1987, assayed between 7.2 ppm and 40.8 ppm Au. Assays of up to 1.58 ppm Au were obtained from the sheared, pyrite-bearing contact of a quartz-feldspar porphyry dyke that was traced discontinuously for 500 m. A series of quartz veins, intruded along the sheared contact of a tonalite stock in the centre of Prospecting Permit 1083, were found to contain chalcopyrite, pyrite and trace galena, with local argentite. Assays of samples taken in 1986 and 1987 range from 146 ppb Au to 10.6 ppm Au.

PETER CLAIMS

Borealis Exploration Ltd.
960, 540 5th Ave. SW
Calgary, Alta., T2P 0M2

Gold
55 L/07
62°18'00"-62°21'35"N
94°38'20"-94°46'40"W

REFERENCES

Davidson (1970); Wright (1967).
DIAND assessment report: 082599.

PROPERTY

PETER 1-4 (F10110-F10113).

LOCATION

The claims are approximately 100 km west-northwest of Whale Cove, between Quartzite and Kaminak lakes (Fig. 5-6).

HISTORY

A general history of the area is outlined in the description of Prospecting Permits 1082 and 1083 (Noble Peak Resources Ltd. "Happy Lake" Project).

The PETER group of 108 claims was held by Giant Yellowknife Mines during the early 1960s. Samples from a belt of sericite schist, traceable for a strike length of 3.2 km and up to 1.6 km wide, yielded encouraging gold assays. In 1961, 1600 m of diamond drilling in 12 holes failed to outline any economic gold and the claims were abandoned.

DESCRIPTION

Kaminak Group felsic pyroclastic breccias and agglomerates, with lapilli and bomb tuffs, intercalated with mafic flows are found between Quartzite and Kaminak lakes (Fig. 5-6). Near Quartzite Lake, local pockets of fine-grained crystal tuff are interlayered with greywacke and conglomerate. In the north, Aphebian orthoquartzites overlie the Kaminak Group rocks. A number of quartz-feldspar porphyry bodies intrude the volcanic assemblage.

A system of curvilinear faults, crossing PETER 2, trends northwest in the western portion of the claim, to west-northwest further east. A synformal structure is developed east of this fault splay. Folding is believed to be contemporaneous with shearing.

A sericite schist unit trends in a northeasterly direction across the claims. It is 1.5 km in width and traceable for 4 km.

The protolith is believed to have been rhyolite tuffs that were subsequently highly sheared. Locally, the schists contain 1% to 15% pyrite and pyrrhotite disseminated along favourable layers. Characteristic mineralogy is sericite, talc, actinolite/tremolite, carbonate and minor chlorite. Quartz flooding and carbonate alteration are found within the unit. Larger quartz veins within quartz-flooded zones contain trace chalcopyrite and sphalerite in places.

CURRENT WORK AND RESULTS

In 1986, Borealis Exploration Ltd. acquired PETER 1-4 and reconnaissance mapping and prospecting concentrated on the sericite schist units, known anomalies and cross-cutting faults. Of the 50 lithogeochemical samples collected, three samples of quartz and one sample of sericite schist contained anomalous gold. Thirty pan concentrate samples were taken, but no visible gold was observed.

ERIC AND MAGUSE LAKE PROSPECTS

Sunmist Energy '85 Inc.	Gold
206, 215 10th Ave. SW	55 E/11,10,6
Calgary, Alta., T2R 0A4	61°35'N, 95°12'W

REFERENCES

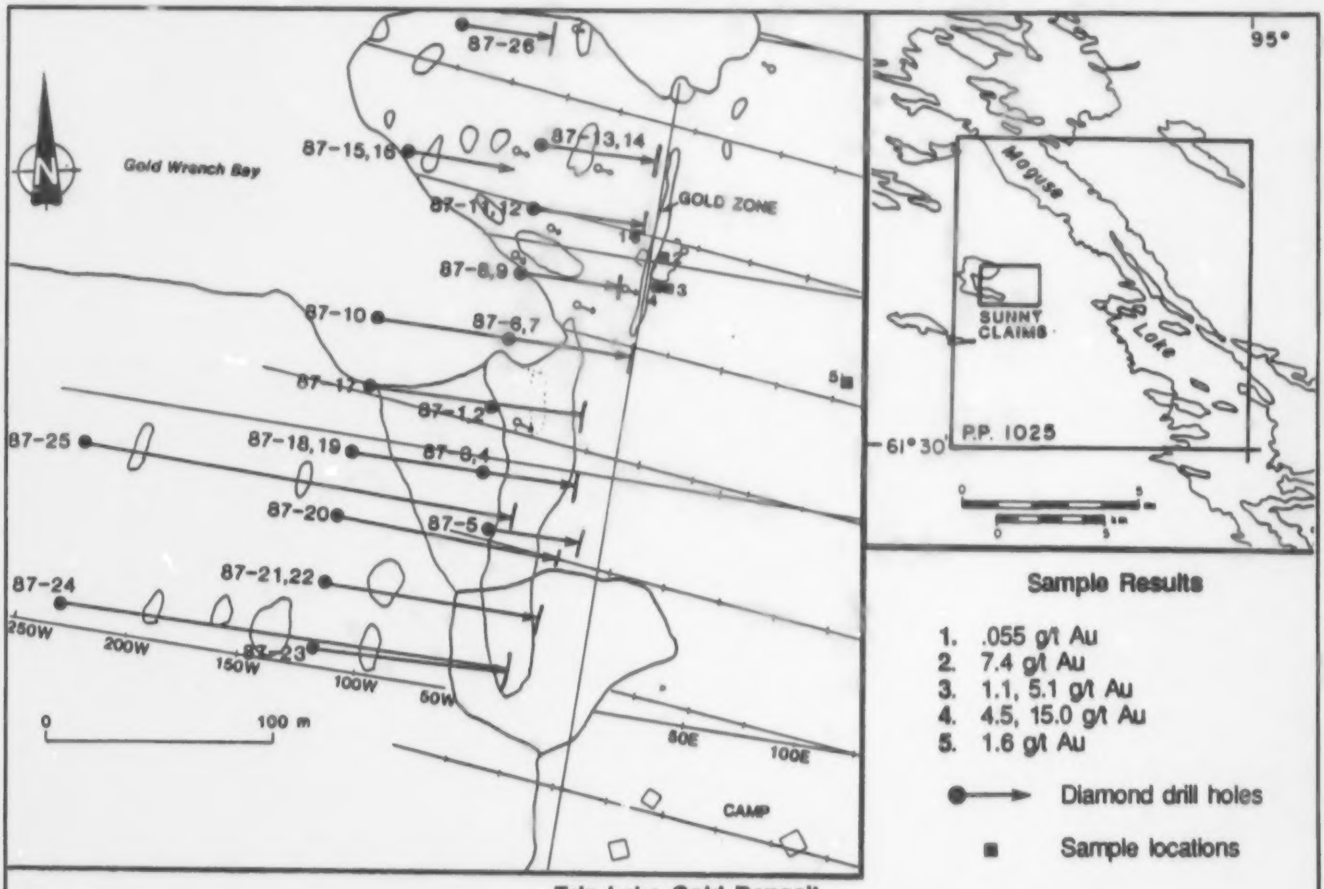
Laporte (1987).
DIAND assessment reports: 082090, 082731.

PROPERTY

MISTY 1-23 (F12332-F12354).
SUNNY 1-2 (F12355-F12356).
Prospecting Permit 1025.

LOCATION

The property is approximately 100 km west-northwest of Arviat and 325 km north of Churchill. The claims straddle the narrow central reaches of Maguse Lake (Fig. 5-7).



N
Gold Wrench Bay
87-26
87-15,16
87-13,14
GOLD ZONE
87-11,12
1
2
87-8,9
3
4
87-10
87-6,7
5
87-17
87-1,2
87-25
87-18,19
87-3,4
87-20
87-5
87-21,22
87-24
87-23
250W
200W
150W
100W
50W
0
100 m
50E
100E
CAMP
95°
Maguse
Lake
SUNNY CLAIMS
P.P. 1025
61°30'
0
5
0
5 km
Diamond drill holes
Sample locations

Sample Results

1. .055 g/t Au
2. 7.4 g/t Au
3. 1.1, 5.1 g/t Au
4. 4.5, 15.0 g/t Au
5. 1.6 g/t Au

Eric Lake Gold Deposit
Intersections of > 1 ppm Au over > 1 m drilled width

Hole No.	From (m)	To (m)	Gold g/t
87-2	66.2	78.7	1.6
87-4	77.6	84.3	8.7
87-6	54.0	55.8	9.3
	63.9	65.4	6.0
87-11	71.6	73.5	25.0
87-18	145.8	149.0	29.5
87-23	140.2	141.7	1.2

FIGURE 5-7: Drill hole plan and sample location, SUNNY claims.

HISTORY

ERIC 1-36 were staked in 1966 and 1967 to cover a gold showing discovered by Selco Northern Ltd. prospectors. The showing was geophysically and geochemically surveyed. Six Winkie diamond-drill holes, totalling 44.6 m, tested a 46 m strike length of the zone. In 1968 Prospecting Permit 57 was acquired and an aggregate of 1238.4 m of diamond drilling in 12 holes, geological mapping, magnetic surveys, geochemical surveys and prospecting was done. Results indicated that the showing was subeconomic (Thorpe, 1972). The claims and permit lapsed between 1968 and 1970.

L.K. Lytte staked GOLD 1-6 in 1972, covering the showing (GOLD 2 and 3) and surrounding areas. In 1973 Mr. Lytte excavated trenches on GOLD 2 and 3. The other claims lapsed. GOLD 2 and 3 were transferred to L. Dempster in 1975. Mr. Dempster carried out further trenching and channel sampling of the showing in 1979. Two channel samples were collected and assayed 471.44 ppm Au over 15 cm and 23.6 ppm Au over 106.7 cm. GOLD 2 and 3 lapsed in 1979 and 1982 respectively.

LAB 1 and 2 were staked adjacent to GOLD 3 in 1980 and in 1982, LAB 3 was staked to replace GOLD 3. The claims underwent a series of transfers between 1983 to 1984. In 1984, M. Magrum acquired Prospecting Permit 1025 surrounding the area of the claims.

DESCRIPTION

The property is underlain by volcanic and sedimentary rocks of the Archean Kaminak Group, intruded in the southwest by Archean hornblende tonalite of the Turquetil Complex. Phyllite and schist, derived from the typical Archean greywacke-slate assemblage, quartzites, mafic volcanics, subordinate intermediate crystal tuff and felsic-ash to lapilli tuff with cherty interbeds underlie the eastern half of the permit area. Magnetite iron formation boulders were observed in the area of AEM anomalies and form discontinuous beds within other rock units. The iron formation contains up to 5% sulphides, most commonly pyrrhotite with lesser pyrite. Aeromagnetic data indicates that the iron formation forms extensive arcuate layers within the metasedimentary package. Greenschist-facies mafic metavolcanic rocks, locally intercalated with more felsic flows, tephra and graphite schists, outcrop along the northern edge of the permit area and to the west in contact with the tonalite intrusion (Davidson, 1970).

The Eric showing on SUNNY 2 is near the mafic volcanic-tonalite contact. Detailed mapping by Selco Northern Ltd. indicates the showing is in north-striking, steeply dipping amphibolitic andesite enclosing thin layers of metamorphosed rhyolite tuff and flows. Gold is hosted by a zone of silicified andesite underlain by a rhyolite tuff layer 1.5 m thick. The zone widens from less than 1 m in the north to 15.2 m in the south and contains 5% to 10% sulphides. Pyrrhotite and minor chalcopyrite, pyrite and sphalerite form streaks and lenses in the amphibolite bands and intergrowths with wall-rock inclusions in the quartz veins. Rare specks of visible gold have been noted. Gold is erratically distributed and shows no correlation to quartz and sulphide content.

CURRENT WORK AND RESULTS

Sunmist Energy acquired the LAB claims and Prospecting Permit 1025 in 1986. MISTY 1-6 and 8-23 were staked in 1986 to encompass the area of Prospecting Permit 1025. The claims superseded Prospecting Permit 1025 on its expiry date in January 1987. MISTY 7 is contiguous with the MISTY claim group and covers ground north of the original permit area. LAB 1 and 2 were surrendered in 1986 due to staking irregularities and were replaced by SUNNY 1 and 2 respectively.

In 1986, a two-person crew carried out reconnaissance geological mapping and prospecting with follow-up detailed mapping, overburden geochemistry and ground magnetometer and VLF EM surveys.

A showing of Ag-Bi-Pb-Zn-Au, referred to as the Eastern Quartz vein, was identified in an amphibolite unit with crystal and ash tuff interbeds. A 2.7 km grid was laid out over the showing and magnetic and VLF surveys were carried out along with detailed geological mapping. Coincident magnetic and VLF anomalies extend northeast from the Eastern Quartz vein for 200 m. A second weak conductor associated with small en-echelon quartz veins was delineated northeast of the Eastern Quartz vein. Three of 15 samples taken assayed from 0.7 to 0.9 ppm Au. One sample of quartz with bismuthinite assayed 421 ppm Ag.

A reconnaissance overburden geochemical survey was carried out 20 m up ice to 450 m down ice over the Eric showing. Analytical results indicated an anomalous pattern of gold enrichment centred on the showing.

In 1987, a combined magnetometer/EM airborne survey and a till sampling survey covered a large part of the claim group. The Ghostly Lake grid was established to cover anomalous tills south of Eric Lake and controlled mapping, magnetic and VLF EM surveys.

Thirty-one drill holes totalling 4186.4 m were collared on the Eric Lake zone, including six holes (616.0 m) drilled on magnetic anomalies north and west of the structure. Drilling tested the zone to a depth of 210 m and indicated gold grades become erratic at depth.

A second phase of drilling thirteen holes (1570.0 m) was designed to test the provenance of strongly anomalous till samples on the Ghostly Lake grid. No gold-bearing zones were intersected. It was concluded that the anomalies are not close to a bedrock source.

TURQUETIL LAKE PROJECT

Dejour Mines Ltd.	Gold
390 Bay St., Suite 2000	55 E/13, L/4; 65 H/16, I/1
Toronto, Ont., M5S 2R9	Centred on 62°00'W, 96°00'N

REFERENCES

Laporte (1983b).
DIAND assessment report: 082549.

PROPERTY

SPI 1 (F14773).
SPI 2-18 (F14775-F14791).
JOYCE 1 (F06453).

LOCATION

The property is on the northwest shore of Turquetil Lake, approximately 125 km southwest of the Hamlet of Whale Cove and 60 km northwest of Eskimo Point (Fig. 5-8).

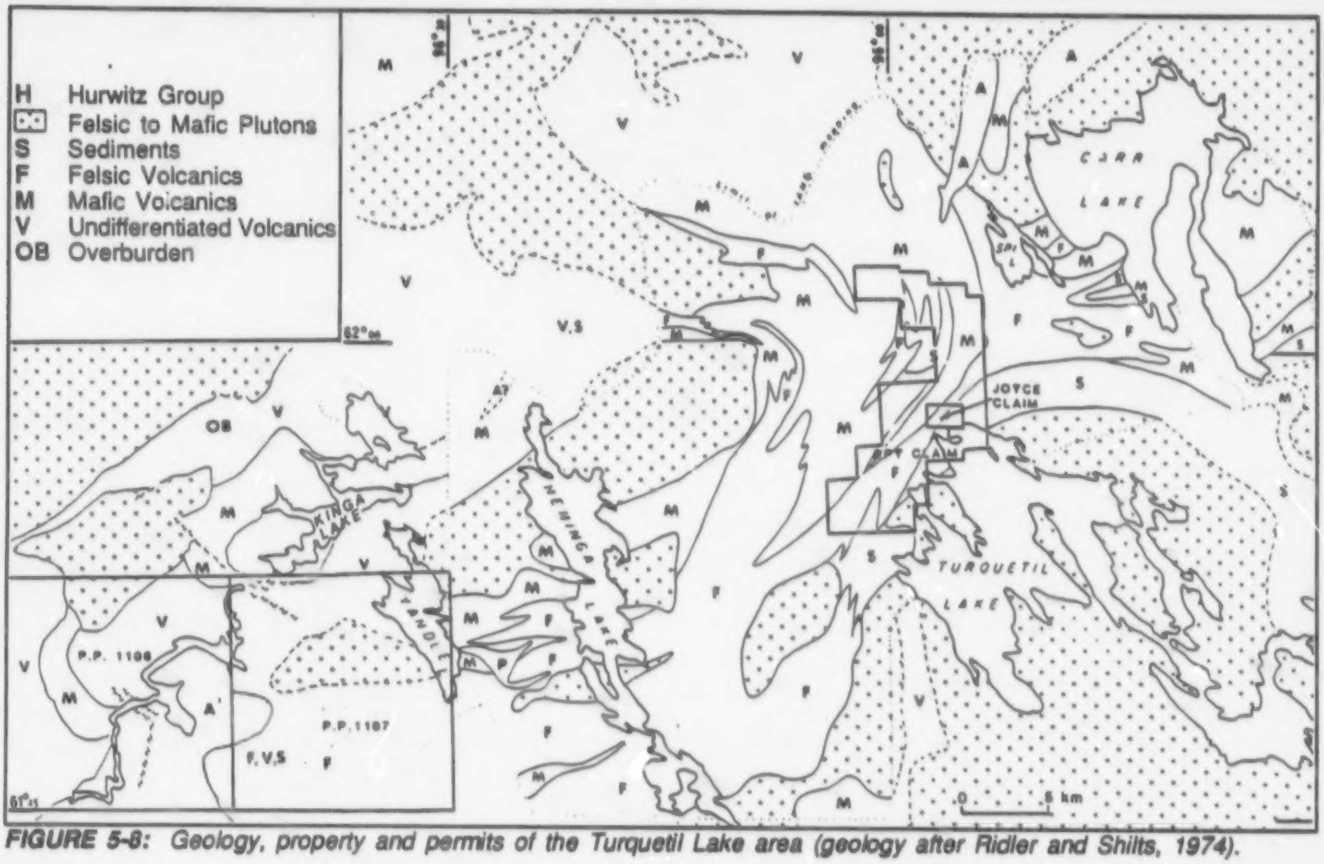


FIGURE 5-8: Geology, property and permits of the Turquetil Lake area (geology after Ridler and Shilts, 1974).

HISTORY

During a regional reconnaissance in 1961 and 1962, Giant Yellowknife Mines acquired the current Turquetil Lake Project area as Prospecting Permit 9. Trenching and four drill holes aggregating 86.6 m were completed. One hole intersected 2.0 ppm Au over 4.27 m and 3.0 ppm Au over 1.22 m from a zone of quartz veining, with carbonate, chlorite, pyrite and arsenopyrite.

In 1969 an airborne magnetometer and EM survey, flown by Geoterrex for Penarroya Ltee, covered the present day JOYCE claim. Pennarroya acquired BEL 1-233 over the area in 1970, which lapsed over the period from 1971 to 1978.

In 1971, Canadian Superior Exploration flew a multisensor airborne survey that outlined a number of weak conductors with coincident magnetic anomalies.

U.S. Steel (now Essex Minerals Company) staked the RAT and the TAU claims in 1975. In 1976, one hole was drilled on what is now staked as the JOYCE claim; it intersected 5.5 ppm Au over 7.9 m true width. Geological mapping, magnetometer, IP and VLF EM surveys were carried out in 1977 and outlined a series of west-southwest-trending IP anomalies flanking and paralleling linear magnetic highs. Six holes were drilled during 1978 to test geophysical targets, but failed to delineate economic concentrations of gold. The claims lapsed in 1979.

The JOYCE claim was staked in 1984 and the SPI claims in 1987. The claims are held jointly by Dejour Mines Ltd. and Noble Peak Resources.

DESCRIPTION

The property is underlain by one cycle of felsic and mafic volcanics, ranging from massive to pillowed basalt flows with intercalated flow top breccias in the south, to felsic breccias and intermediate to felsic lapilli tuffs and agglomerate in the north. In the south and central portion of the property, shear-hosted carbonate alteration with boudins and lenses of carbonate-quartz replace mafic volcanics interlayered with minor felsic tuff and cherty lenses.

The supracrustals are synclinally folded. Quartz-carbonate stockworks, as well as gold, sulphides and arsenides, are hosted in iron-carbonatized mafic volcanics. The volcanics are intruded to the southwest by the Turquetil Batholith. The rocks are regionally metamorphosed to greenschist facies reaching upper greenschist facies within contact aureoles of granitic intrusions. Hydrothermal alteration is pervasive throughout the property, resulting in leaching and carbonatization of the rocks.

CURRENT WORK AND RESULTS

Geological mapping, rock sampling and channel sampling was carried out during the 1987 field season. Carbonatized intermediate to mafic volcanics, iron carbonate lenses, carbonatized basalt flows and iron oxides were sampled in the south and central portions of the property. In the north, all rock types, particularly those showing evidence of hydrothermal alteration, were sampled. Where there was sufficient exposure of outcrop, channel samples were cut along traverses. Elevated gold was detected in carbonatized, leached and quartz-veined mafic volcanics in the north and east central area of the claim group. The highest gold assay, 17 ppm Au, was obtained from quartz-veined mafic volcanic rocks in old trenches on the JOYCE claim.

PERMITS 1106, 1107

Borealis Exploration Ltd.
960, 540 5th Ave. SW
Calgary, Alta., T2P 0M2

Gold, Silver
65 H/15
61°45'-61°52'N
96°30'-97°00'W

REFERENCES

DIAND assessment reports: 019954, 082142.

PROPERTY

Prospecting Permits 1106, 1107.

LOCATION

The permits are along the Padlei River, 20 km northeast of Henik Lake. The area is approximately 370 km north-northwest of Churchill, Manitoba (Fig. 5-8).

HISTORY

Kasba Exploration regionally prospected the area between Padlei and Quartzite lakes in 1949 and 1950. Visible gold was panned from quartz pebble conglomerates in the Padlei Lake area. Samples collected on the LOWO claims in the Heninga Lake area assayed as high as 167 ppm Au.

In 1969, the DEN claims in the Henik Lake area were mapped by Denison Mines Ltd. A pyritic quartz pebble conglomerate was targeted for further evaluation of uranium and gold potential. Drilling in 1970 intersected the basal quartz pebble conglomerate which was assayed for uranium only.

In 1969, Enex Mines Ltd. prospected and conducted scintillometer surveys at Kinga and Jens lakes. Two radioactive conglomerate showings were found. In 1970, Falconbridge Nickel Mines Ltd. drilled seven holes but encountered no economic mineral concentrations.

Noranda Exploration Co. Ltd. flew 625 line-km of EM and magnetic surveys over the Yandle Lake area during 1974. Five conductors were delineated that were found to be associated with iron formation.

Western Mines Ltd. conducted sampling on the old DEN claims. Samples were analyzed for gold, uranium, thorium and base metals. The highest gold assay, 0.6 ppm, was obtained from a quartz pebble conglomerate.

St. Joseph Exploration Ltd. drilled 1257 m in nine holes in the Heninga Lake area. The best intersection was 1.7 ppm Au over a 1.3 m core length.

DESCRIPTION

The permit area covers Archean felsic and mafic volcanics, pyroclastics and sediments. Discontinuous beds of oxide-facies iron formation are intercalated with the volcanics. The rocks are intruded by mafic dykes and granitic stocks in the west portion of the permit area. A synform axis trends from Wolks Lake to Kinga Lake. Hurwitz quartz pebble conglomerates, quartzites and shales unconformably overlie the Archean rocks. In the Padlei River area, black argillaceous shales, 50 to 100 m thick, grade into sandstones and siltstones with a few pebbly units. The basal conglomerate is gold bearing and radioactive. At Wolks Lake and Kinga Lake, the unit contains 90-95% quartz pebble fragments and up to 10% jasper fragments. At Kinga Lake, 5-15% pyrite was contained within the matrix of monomictic quartz conglomerate.

CURRENT WORK AND RESULTS

Reconnaissance mapping during 1986 concentrated on areas around showings. Rock and pan concentrate samples were taken from the showings and surrounding areas. Three of 15 pan concentrate samples contained visible gold in the first fraction. The three samples were taken in different localities of quartz pebble conglomerate outcrop. Forty-two samples of conglomerate were taken; ten assayed greater than 50 ppb Au. The highest assay from the conglomerate was 412 ppb Au. Ten samples of quartz pebble conglomerate collected in the Kinga Lake area assayed as high as 143 ppb Au, with seven samples over 50 ppb.

SUNDOG PROJECT

Homestake Mineral Development Co.
1000 - 700 W Pender St.
Vancouver, B.C., V6C 1G8
(50/50 JV with Abermin Corporation)

Gold, Base Metals
65 G/8
61°25'N, 98°10'W

REFERENCES

Laporte (1987).
DIAND assessment report: 082609.

PROPERTY

SUNDOG 1 (F12150).

LOCATION

The claim is approximately 280 km northwest of Churchill, Manitoba, 11 km northeast of Cullaton Lake.

HISTORY

The first recorded exploration in the area was in 1948 by Hudson Bay Mining and Smelting. Nine holes were drilled in quartzite at a showing near Bernier Lake. The best assay was 15.42 ppm Au over 3 m.

From 1961 to 1965, Selco Exploration Ltd. conducted regional exploration of the area between 61°00'-62°00'N and 96°00'-99°00'W. A number of gold showings were discovered, including the "B zone", the Shear Lake deposit and the MacDonald showing. The "B zone" and the Shear Lake deposit were brought into production by a consortium of companies under the name Cullaton Lake Gold Mines Ltd. The mine operated between 1981 and 1985 and was then placed on caretaker status due to low gold prices. Estimated proven and probable reserves remaining were 81 455 t grading 16.8 ppm Au.

The GREG claims, approximately 6 km northwest of SUNDOG 1, were staked by Selco to cover two gold-bearing zones in silicified, chloritized quartz-feldspar-biotite schists. The property was allowed to lapse after mapping, trenching and boulder sampling. Esso Resources Canada staked the BANSHEE claim over the showings in 1981. The showings were re-examined and 14 holes totalling 202 m were diamond drilled. Up to 3.98 ppm Au over 3.05 m and 9.58 ppm Au over 0.33 m was intersected.

The MIKE claims were staked by Suncor Inc. in 1983, immediately southwest of SUNDOG 1. A grid was established over the MIKE 1 and 2 claims to follow up on a magnetic linear and an anomalous lake sediment sample. Ground magnetometer and VLF surveys were conducted.

DESCRIPTION

The claim covers the western limb of a south-southeast-plunging anticline. Regionally, clastic and intermediate to mafic volcanics and related synvolcanic intrusions of the Archean Henik Group are unconformably overlain by Proterozoic mature sediments, slate, shale, siltstone and minor greywacke of the Hurwitz Group. The Archean and Proterozoic assemblage is in fault contact to the west with impure quartzite of the Hurwitz Group (Fig. 5-9).

Within the gridded area of the claim, siltstones and greywackes predominate, interbedded with subordinate basalts, gabbro and quartz-feldspar porphyry. Four distinctive greywacke units were identified on the property. The first, a very fine-grained siliceous rock with quartz eyes and minor disseminated sulphides, underlays the northwest portion of the gridded area. "Clean to dirty" greywackes underlie most of the grid area and are fine grained, slightly phyllitic, siliceous to carbonate-rich rocks. A phyllitic to schistose greywacke/siltstone unit is compositionally layered or laminated and highly carbonatized. All greywacke units locally host quartz-tourmaline veins. A unit of mudstone interlayered with volcanics in the south of the claim hosts quartz veins and stringers. Isolated mafic volcanics outcrop in an area at the north end of the grid and usually contain 5% pyrrhotite with local concentrations of magnetite and quartz eyes. Quartz veining is rare in the mafic volcanics.

CURRENT WORK AND RESULTS

In 1986 the MacDonald showing, discovered by Selco in 1961, was re-examined. Rock and panned concentrate samples were collected. The best assays were 62.8 ppm Au and 8.6 ppm Ag. The SUNDOG 1 claim was staked to cover the showing, and held by Abermin Corporation.

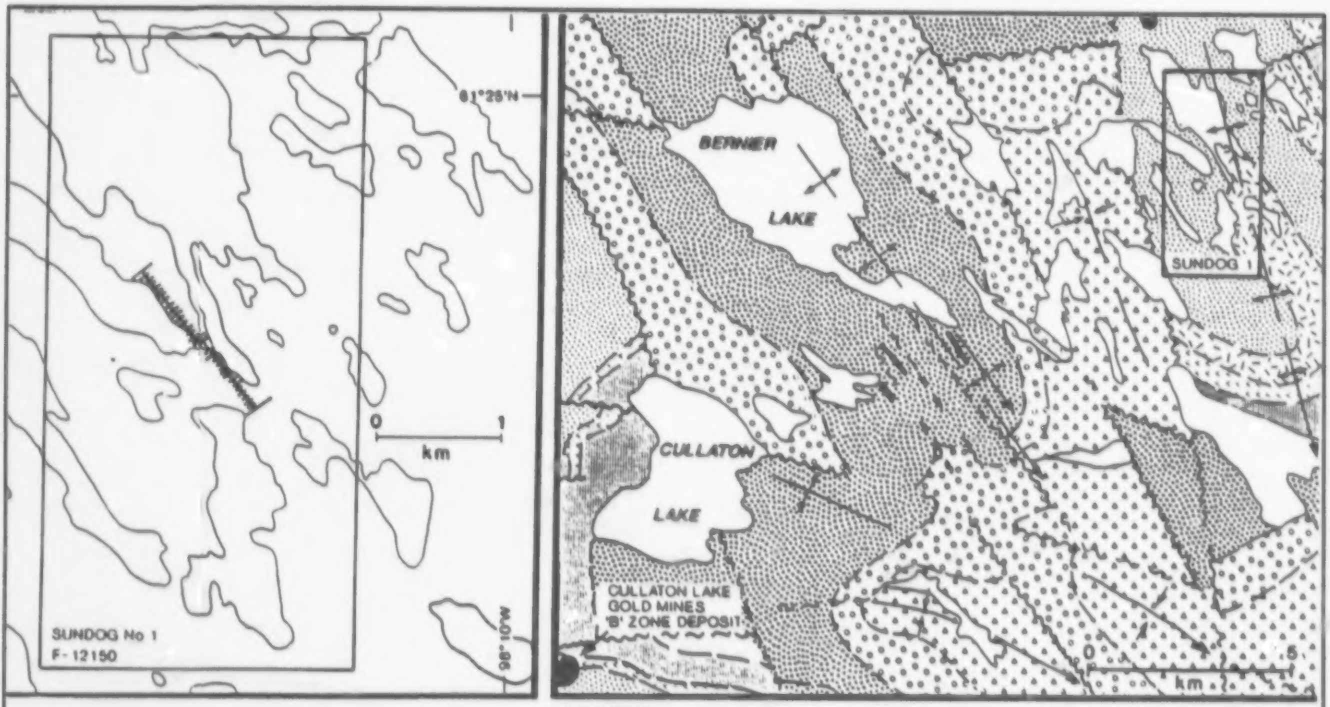

61°25'N
0
1
km
SUNDOG No 1
F-12150
96°10'W
BERNIER
LAKE
SUNDOG 1
CULLATON
LAKE
CULLATON LAKE
GOLD MINES
'B' ZONE DEPOSIT
0
5
km
LEGEND
APHEBIAN
Diabase
Impure quartzite, arkose, siltstone, some greywacke
Greywacke, minor siltstone
Slate, shale, siltstone, minor greywacke
Orthoquartzite, minor arkose, pebble conglomerate
Dolomite, argillite, siltstone, some greywacke
ARCHEAN
Clastic rocks, greywacke argillite, phyllite, tuff, minor conglomerate, quartzite, iron formation, dolomite
Andesite, dacite, basalt, rhyolite; gabbro, diorite
Anticline with plunge
Syncline with plunge
Fault
Contact

FIGURE 5-9: Geology of the SUNDOG claim (after Eade, 1974).

During the 1987 field season a grid with a baseline orientation of 140° and cross line spacing of 20 m was established along the peninsula that separates Camp and Peninsula lakes. The grid area was mapped in detail and trenching targets were identified. A number of trenches and pits were excavated over areas of extensive quartz veining. Some of the pits established in 1986 during the initial property evaluation were enlarged. Trenches are up to 45 m long, 2 m wide and 2 m deep. Pan concentrate and quartz vein samples were collected from the trenches. Anomalous copper, lead, zinc and arsenic content was detected in the samples.

A VLF EM survey, covering 25 line-km of the grid area, detected a number of conductors, none of which could be correlated with known auriferous veins.

Humus samples were collected at 8 m intervals over portions of the grid area. Several multiline copper, silver and arsenic anomalies were detected. Gold concentrations were erratic.

SANDYBEACH PROPERTY

Claude Resources	Gold, Uranium
310, 224 4th Ave. S	65 B/4 NW,
P.O. Box 7380	65 B/4 SW
Saskatoon, Sask., S7K 4E4	60°07'N, 99°55'W

REFERENCES

Eade (1972); Charbonneau and Swettenham (1986).
DIAND assessment report: 082754.

PROPERTY

JAN 1 (F13102).
JAN 2 (F13099).
Prospecting Permits 1153, 1154.

LOCATION

The Sandybeach property is 320 km north of Lynn Lake, Manitoba and 144 km south-southwest of Cullaton Lake (Fig. 5-10).

HISTORY

All previous work in the area was carried out by the GSC. The area was mapped in 1952 as part of a geological reconnaissance of the southern District of Keewatin and from 1969 to 1970 by Eade (1973). A GSC airborne gamma-ray spectrometer survey flown in 1978 detected an anomaly on the north shore of Sandybeach Lake. In 1985, a follow-up ground survey (Charbonneau and Swettenham, 1986) found sulphide-bearing calcsilicate boulders. The boulders contained visible gold and scheelite and assayed greater than 1000 ppm U and up to 12.6 ppm Au.

DESCRIPTION

The claim group covers Archean greywackes and argillites, now metamorphosed to paragneisses, paraschists and meta-arkoses. The gneisses are banded, the result of relict bedding and have abundant pegmatite and granite stringers. Narrow bands, 2 to 8 cm thick, of plagioclase-rich meta-arkose are developed in the gneisses. The sediments have been affected regionally by amphibolite-grade metamorphism and locally by contact metamorphism.

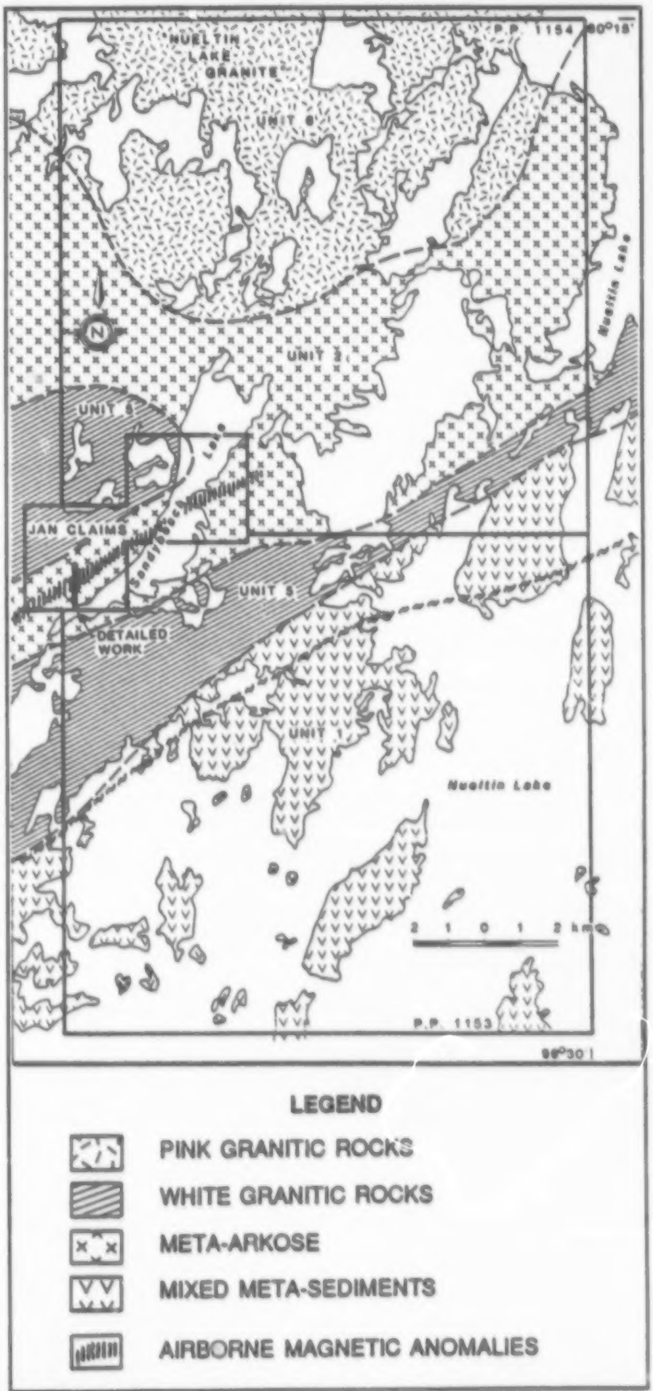


FIGURE 5-10: Geology of the Sandybeach Lake area (after DIAND assessment report 082754 and Eade, 1973).

An elongate granodiorite pluton, Aphebian in age, intrudes the sediments. The rock is medium to coarse grained, in places porphyritic and locally weakly foliated. Biotite, in places accompanied by hornblende, forms the mafic component. Tourmaline is abundant. Scattered garnets and inclusions of paragneiss and meta-arkose are found within the pluton (Fig. 5-10).

The "Nueltin Lake Granite" intrudes both Archean and Aphebian rocks. A mineral thought to be Th-U-rich allanite, altered to bastnaesite, is found within the biotite grains.

Schistosity is sub-parallel to bedding and trends east to northeasterly. The rocks have been relatively undisturbed by the intrusion of the "Nueltin Lake Granite". An east-northeast-trending fault transects the southeast corner of the property. The fault is thought to have been re-activated during the Hudsonian Orogeny by the intrusion of the "Nueltin Lake Granite".

CURRENT WORK AND RESULTS

In 1986 Claude Resources staked JAN 1 and JAN 2 to cover the boulder showings. Prospecting Permits 1153 and 1154 were subsequently acquired in 1987.

During the summers of 1986 and 1987, reconnaissance prospecting and boulder sampling was conducted on JAN 1 and 2. In 1987 a 1 km baseline was cut for sampling control and 36 samples were collected. Assays of up to 87 ppm Au and 0.641% U_3O_8 were obtained from one boulder.

MELIADINE RIVER PROJECT

Consolidated Five Star Resources Ltd.	Gold
10250 - 101 St.	55 J/13, K/16, N/1
Edmonton, Alta., T5J 3P4	62°51'N, 92°10'W

REFERENCES

Laporte (1974a,b, 1983b, 1985b); Tella (1986); Tella *et al.* (1986).

DIAND assessment report: 082118.

PROPERTY

JON 1 (F08252).

LOCATION

The claim is on the north shore of Rankin Inlet at Prairie Bay, approximately 5 km north of the Hamlet of Rankin Inlet (Fig. 5-1).

HISTORY

In 1928, a copper-nickel deposit on the south shore of Prairie Bay was discovered. It was mined by North Rankin Nickel Mines Ltd. from 1957 to 1962. The mine produced 9660 t of nickel and 2630 t of copper from the 368 093 t of ore.

Between 1969 and 1972, the Rankin Nickel Syndicate conducted airborne and ground geophysical surveys of the area, followed by geological mapping and diamond drilling of conductors, but failed to outline zones of economic interest (Laporte, 1974a,b).

Twenty-four claims were staked by Consolidated Five Star Resources Ltd. in late 1980 and early 1981. All but the JON claim have since lapsed.

DESCRIPTION

The area is underlain by Archean rocks of the Rankin Inlet Group, comprising greywacke with minor conglomerate, quartzite and dolomite, overlain by massive and pillowed basaltic flows. The base of the volcanic sequence is intruded by gabbro sills. Three serpentinite sills, one of which hosts the North Rankin Nickel Mines Ltd. orebody, outcrop at the base of the volcanic pile. Along the south shore of the inlet the sediments are in fault contact with quartz monzonite and are intruded by a granite pluton in the east. Metasomatic alteration accompanied the intrusion of both the granitic and mafic rocks.

Two periods of folding affected the Rankin Inlet Group rocks. First-generation recumbent isoclinal folds with northwest-trending axial planes were formed by gravitational sliding. Second-generation folds are symmetrically disposed about the axis of the granitic intrusion and have east- to southeast-trending, near vertical axial planes. Faults and some photo lineaments trend northwesterly. The lower 10 km of the Meliadine River is confined to one such fault. Glaciation has disrupted drainage patterns in the area.

CURRENT WORK AND RESULTS

In October 1986, five days were spent collecting geochemical samples. Pan concentrate samples of reworked sediments were taken along a 12 km section of the Meliadine River. The samples, from areas of active drainage, contained geochemically anomalous amounts of gold. A bedrock source for the gold was not found.

FERGUSON LAKE PROPERTY

Homestake Mineral Development	Platinum, Palladium
1000 - 700 W Pender St.	65 I/14,15
Vancouver, B.C., V6C 1G8	62°52'N, 96°51'W

REFERENCES

Bell (1971); Laporte (1984).

DIAND assessment report: 082539.

PROPERTY

KANGA 1-2 (F13470-F13471).
ROO 1-2 (F13710-F13711).
ROO 3 (F13713).
Prospecting Permits 1114, 1115 (65 I/15 NW, SW).

LOCATION

The Ferguson Lake property is approximately 224 km southwest of Baker Lake (Fig. 5-1).

HISTORY

In 1950, the Canadian Nickel Company Ltd. acquired a 1280 km^2 prospecting concession which covered the Ferguson Lake area. A five year program of geological and geophysical surveys outlined the Ferguson Lake deposit. The deposit consists of a Main zone of discrete and in places parallel gossanous zones up to 10 m thick. Ore is discrete pods of massive breccia-type ore with 60% to 90% pyrrhotite, or continuous stringer-type ore of chalcopyrite-pyrite-pyrrhotite stringers and veinlets. The deposit was tested along a strike length of 7.7 km and to a depth of 250 m by more than 90 000 m of diamond drilling and bulk sampling. A mineral inventory of 6 350 400 t with grades of 0.87% Cu and 0.75% Ni was delineated.

FERG 1-200 and DISC 1-8 were staked in 1955 and taken to lease in 1957. The lease for 100 of the FERG claims was renewed in 1978. In 1980 Esso Minerals Canada optioned the property and contracted Barrenlands Exploration Ltd. to extract a 9.1 t bulk sample.

DESCRIPTION

The area can be subdivided into three types of migmatite terrain based on mineralogy and weak stratigraphic correlation. Three groups of gneisses can be distinguished. The first group is characterized by layered to irregularly layered amphibole-feldspar or biotite-quartz-feldspar gneisses and associated amphibolites, hornblendites and metagabbro of metavolcanic and mafic to intermediate plutonic affinity. The second group is layered to nebulitic gneisses and migmatites of sedimentary affinity. Pink orthogneisses, gneissic granites and pink porphyroblastic granitic gneisses of granitic plutonic affinity represent the third group. Metamorphic minerals are amphibole and garnets in the first group of gneisses; cordierite and sillimanite are developed locally in the sedimentary gneisses (Bell, 1971).

Layering in the gneisses trends north to northeasterly and dips steeply. The rocks are intruded to the east by the Martell Syenite. Diabase and lamprophyre dykes cut the region.

Mafic amphibolites, the predominant rock type on the property, range in thickness from less than 100 m to approximately 1500 m. Units of hornblendite intercalated within the mafic amphibolite are scattered throughout the property and form a zone that ranges in width from 50 to 200 m and can be traced along strike for a distance of 9 km. The Main zone hornblendite hosts the Ferguson Lake deposit. The zone is sheared, as shown by local brittle failure, narrow anastomosing shears and augen-shaped amphibole clots.

The mafic assemblage is surrounded by orthogneisses and paragneisses represented by quartzo-feldspathic, granitic, pegmatoidal, biotite rich and plagioclase-biotite augen gneisses.

Syn- to post-tectonic gabbro bodies outcrop on the property. The intrusions have been amphibolitized and in places, sheared. Chlorite schist is considered to be the retrograde equivalent of sheared gabbros found nearby. A feldspathic amphibolite, possibly a leucogabbro, is in the middle of the ROO 1 claim. It is locally sheared and sulphide enriched.

Sulphide minerals are contained in gossanous amphibolites and hornblendites, iron formations, leucogabbro, diabase dykes and quartz veins.

CURRENT WORK AND RESULTS

In 1986 Homestake Mineral Development Corporation staked the KANGA and ROO claims on strike with the Inco Main zone and obtained two permits in 1987 covering the northwest and southwest quadrants of 65 I/15.

During the 1987 field season Homestake conducted reconnaissance mapping and sampling on the KANGA and ROO claims and throughout the permit areas. Permission was given by Inco for Homestake to examine the FERG group as part of the reconnaissance exploration, providing no interest was earned.

Iron-oxide-rich soil samples were collected from over the Main zone east and west of Ferguson Lake (within the FERG claims). The soils were analyzed for platinum, palladium, gold, copper, nickel, cobalt and arsenic. Average assays of 455 ppb Pt and 2.6 ppm Pd were obtained, with high assays of 3.7 ppm Pt and 15.2 ppm Pd.

Rock geochemistry analyses indicated 80 ppb to 800 ppb Pt and 20 ppb to 1250 ppb Pd from hornblendite. Massive sulphide from hornblendite-hosted gossans yielded average assays of 190 ppb Pt and 2023 ppb Pd. Average copper content is 0.48% and average nickel content is 0.72%. Concentrations of platinum and palladium in samples from Main zone breccia-type ore range from 50 to 700 ppb and greater than 5000 ppb respectively. Platinum content in the stringer-type ore ranges from 80 to 800 ppb, while palladium ranges from 90 to 1200 ppb.

During reconnaissance exploration, a number of sulphide-enriched zones were found. South of Pointed Lake, within Permit 1115, an east-trending gossanous hornblendite within amphibolite hosts discrete pods and stringers of massive sulphides and has a continuous strike length of approximately 800 m. One sample taken from the gossan yielded 2.8 ppm Pt and 760 ppb Pd. The gossan is thought to represent an offset of the Main zone.

Iron formations were found north of the ROO claims within Permit 1114. These have strike lengths of up to 500 m and contain sulphide, oxide and silicate facies. Sampling did not yield significant results.

A leucogabbro intrusion within ROO 1 contains up to 4% pyrrhotite and chalcopyrite within small scale shears.

SY PROJECT

Homestake Mineral Development Co.	Gold
1000 - 700 W Pender St.	65 I/4,5
Vancouver, B.C., V6C 1G8	62°20'N, 97°33'W

REFERENCES

Eade (1986); Laporte (1987).
DIAND assessment reports 082335, 082541, 082834.

PROPERTY

The claims and prospecting permits are listed in Figure 5-11.

LOCATION

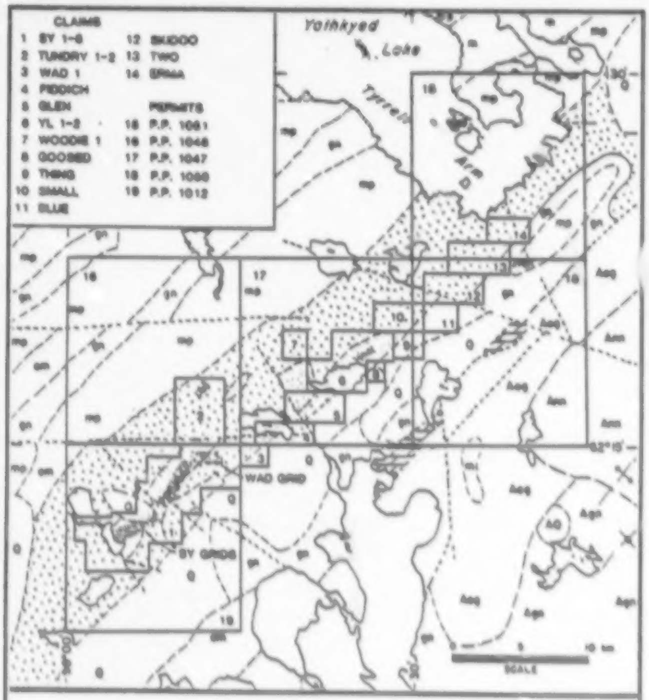
The property is approximately 870 km east of Yellowknife and 460 km north of Churchill, Manitoba (Fig. 5-1). It extends southwest from the Tyrrell Arm of Yathkyed Lake.

HISTORY

From 1969 to 1973 Prudhoe Bay Oils Ltd. held the area of 65 I/4 as Prospecting Permit 176. Columbian Northland Exploration Ltd. contracted Angus Mackenzie to carry out exploration on Prospecting Permit 176 between 1970 and 1973. In 1970, a magnetometer suvey was flown and an airphoto analysis of the region was undertaken. Five zones of interest were identified. Reconnaissance mapping followed up on the survey and in 1971 further mapping, ground magnetometer surveys and trenching was carried out. In 1972, the K claims were staked to cover a magnetic anomaly corresponding to a gossan zone that contained up to 0.06% Cu. The K claims were mapped and prospected in 1973. No economic mineral concentrations were outlined during the exploration work.

Pan Ocean Oil Ltd., the predecessor of Aberford Resources Ltd., prospected for uranium during 1981. A sample was collected from an area corresponding to the SY 4 claim, that contained 3.7 ppm Au. Work in the area in 1983 and 1984 included staking two claims, mapping, prospecting, trenching, channel sampling, ground geophysics and detailed work on three zones. The best assay from the samples was 24.9 ppm Au. Prospecting Permit 1012 (NW 65 I/4) was issued in 1984.

In 1985 Abermin (formerly Aberford) acquired Prospecting Permits 1047 (SE 65 I/5), 1048 (SW 65 I/5), 1050 (SW 65 I/6) and 1051 (NW 65 I/6). The YI claims were staked in 1985.



LEGEND

APHEBIAN	
AQ	Quartz monzonite, granite, in part porphyritic; minor syenite, granodiorite and quartz diorite
Aog	Orthogneiss, largely biotite quartz-monzonite gneiss with potassium feldspar porphyroblasts; cut by up to 15% dykes and stringers of quartz monzonite and granite pegmatite
Ann	Nebulitic and swirled gneiss, in part irregularly layered, predominantly biotite-bearing; contains abundant potassium feldspar porphyroblast and 20 to 25% quartz monzonite
Agn	Layered to irregularly layered gneiss and agmatite, biotite and hornblende-bearing; some migmatized paragneiss; contains up to 50% dykes, stringers and irregular masses of quartz monzonite
	HURWITZ GROUP
▨	TAVANI FORMATION: arkose, meta-arkose, impure quartzite, mica schists
▨	WATTERSON FORMATION: dolomite, phyllite, argillite; and KINGA FORMATION: orthoquartzite
ARCHEAN	
Q	Quartz monzonite to granodiorite, massive to slightly foliated
gn	Granodiorite gneiss, tonalite gneiss and quartz diorite gneiss; includes some orthogneiss, layered gneiss, swirled to nebulitic gneiss and amphibolite inclusions; minor quartz monzonite veins
m	Migmatite to irregularly layered, banded, or nebulitic gneiss; minor agmatite; commonly cut by dykes and sheets of quartz monzonite or pegmatite
	HENIK GROUP
mp	Migmatized paragneiss, amphibolite and granodiorite gneiss
am	Predominantly amphibolite; minor amphibolitic greenstone, amphibole schist and gneiss
▨	Intermediate to felsic metavolcanics; tuff, agglomerate, and flows
▨	Basic metavolcanics; massive or pillowed basaltic and andesite flows, pyroclastics, tuff and agglomerate;minor gabbro and intermediate to felsic flows and tuffs

FIGURE 5-11: Geology and properties, Yathkyed Lake area (geology from Eade, 1986).

DESCRIPTION

The geology of the Yathkyed-Imikula Lake area has been described by Eade (1986). The claims cover a northeast-trending belt of metavolcanics, metasediments and amphibolites of the Archean Henik Group with enclaves of intermediate and felsic tuff, agglomerate and flows and interbeds of oxide- and sulphide-facies iron formation. The iron formations are typically banded oxide facies containing finely bedded magnetite, chert, hornblende/grunerite, garnet, carbonate and sulphides. Sulphide-enriched auriferous iron formations are usually poorly exposed. Local quartz-carbonate-sericite-chlorite schist host fine-grained disseminated pyrite, pyrrhotite, chalcopyrite and up to 4% arsenopyrite. Gabbro dykes and granitoid rocks of late Archean age intrude the Henik Group. Arkoses, phyllites and quartzites of the Aphebian Hurwitz Group, are preserved in a northeast-trending graben and unconformably overlie the Archean rocks (Fig. 5-11).

Three main fault directions have been identified in the area: northeast and a conjugate set of northwest- and east-trending faults. Quartz veins occupy a prominent northeasterly trending fracture set. The veins are discontinuous along strike, up to 3 m wide and have maximum traceable lengths of 200 m. An extensive shear zone trending approximately 035°-055° along the east margin of the greenstone belt has a postulated strike length of 30 km and widths of between 50 to 100 m.

All rocks in the area are strongly deformed and metamorphosed to upper greenschist and lower amphibolite facies.

CURRENT WORK AND RESULTS

Abermin staked SY 3-8 in 1986 and Homestake Mineral Development Company optioned the SY property in the same year.

Geological mapping, lithogeochemistry, humus sampling, VLF EM and magnetic ground surveys and diamond drilling were completed on five grids and surrounding areas during 1986. Three grids were located on the SY claim group, one on the YL claim group and one grid on Prospecting Permit 1048.

Geophysical surveys over gridded portions of the SY and YL claims identified anomalies associated with iron formation. Rock, humus and pan concentrate sampling of frost boils concentrated mainly on the grids and surrounding areas.

Two types of showings were identified. The most significant is stratabound sulphide enrichment within iron formation. Of secondary importance is auriferous quartz-carbonate-sericite schist in ductile shear zones. Surface samples of auriferous iron formation were usually pyrite rich with subordinate pyrrhotite and arsenopyrite and rare chalcopyrite. An assay of 14 ppm Au came from a sulphide-enriched sample.

Auriferous schist was found on the gridded area of YL 1. The highest gold assay from a surface sample was 5.3 ppm. The schist is hosted by altered basalt and is locally enriched with acicular arsenopyrite. Higher gold content is associated with small scale quartz boudins.

During the summer, twelve holes totalling 1213.8 m tested auriferous iron formation or shear zones at depth. Five intersections grading more than 1 ppm Au over greater than two m drilled width were recovered. The highest assay was 4 ppm Au over 3.5 m core length and the widest intersection graded 3.18 ppm Au over 7 m core length.

Reconnaissance mapping during 1987 evaluated a 25 km strike length of mafic and felsic volcanics at a granodiorite and gneiss contact extending southwest from Yathkyed Lake. Geological surveys and sampling investigated 21 zones of shearing, iron formations, quartz veining, gossans or sulphide enrichment. The highest gold assays came from quartz monzonite-hosted quartz veins. One sample assayed 7.96 ppm Au and 274 ppm Ag. Limited magnetometer and VLF surveys were done on an iron formation with poor exposure. Several lines of a magnetometer survey were completed on Yathkyed Lake and outlined a few weak anomalies. Results from the VLF survey were inconclusive.

In 1987, 21 holes totalling 2099.1 m were drilled on the SY and WAD claims to test auriferous iron formation at depth and explore a number of geochemical targets. The best intersection was 3.53 ppm Au over 3.99 m true width. The 1986 and 1987 drilling defined a 230 m bed of iron formation, open along strike, with widths ranging 3.0 to 5.0 m and gold grades of up to 5.7 ppm over 3 m.

In the fall of 1987, 13 claims were staked to complete the coverage of a 45 km strike length of the volcanic assemblage.

BAKER LAKE - THELON RIVER AREA

Rocks of the Whitehills-Tehek Lake area consist of tracts of Archean greenstone and layered amphibolite enclosed by gneissic or granitic complexes and overlain by Aphebian shallow-marine sediments. In the Baker Lake area, intermediate to felsic volcanic flows and pyroclastics and continental sediments of the Proterozoic Dubawnt Group overlie the older assemblage in structurally controlled depressions resulting from the Hudsonian Orogeny (Laporte, 1987; Urangesellschaft, 1989).

The uranium potential of the Proterozoic sequences of the Baker Lake area has attracted exploration interest since the late 1970s following the discovery of uranium in northern Saskatchewan during the late 1960s. Miller (1980) reports three uranium associations in the Baker Lake basin: northeast- and east-northeast-trending fault and fracture hosted U-Cu-Ag-Au-Se or U-Cu-Pb-Mo-Zn in the Dubawnt Group and basement gneisses; diatreme breccia containing U-Cu-Zn in basement gneisses; and U-Cu-Ag impregnations and fracture fillings in altered arkose peripheral to lamprophyre dykes.

In 1986-87 exploration targets were divided between Kiggavik-type unconformity-related uranium in the area south of Baker Lake and gold in the Archean rocks of the Parker Lake and Tehek Lake areas.

PARKER LAKE PROJECT

Comaplex Minerals Corp	Gold
910 - 1015 4th Ave. SW	55 M/9,10
Calgary, Alta., T4R 1J4	63°33'N, 94°37'W

REFERENCES

Reinhardt (1980); GSC Open File 417 (1976).
DIAND assessment reports: 062145, 062529, 062560.

PROPERTY

Prospecting Permit 1108 (55 M/9 SE).
Prospecting Permit 1109 (55 M/10 SW).
Prospecting Permit 1112 (55 M/10 SE).

LOCATION

Prospecting Permits 1109 and 1112 are contiguous and are immediately north of MacQuoid Lake. Prospecting Permit 1108 is northeast of MacQuoid Lake (Fig. 5-12). The property is approximately 110 km southeast of the town of Baker Lake.

HISTORY

The area was mapped in 1954 by Wright (1967) and again in the early 1970s by Reinhardt (1980) who delineated an extensive gossan zone within the area of Prospecting Permit 1108. In 1976 the GSC conducted a regional lake bottom sediment study in the area of NTS 55 M. Sediments were analyzed for 12 elements. Two samples from the area of Prospecting Permit 1108 yielded between 2-5% As.

A number of companies were active during the 1970s, examining the uranium potential of the area north and west of the permits. L. Curtis staked RS 1-3 in 1985, but the claims were never recorded. Comaplex workers found evidence of sampling along the gossan in Prospecting Permit 1108.

DESCRIPTION

The permits straddle the contact between an enclave of hornblende-rich rocks of mafic volcanic and possibly intrusive origin and an extensive area of granite and gneiss terrain (Wright, 1967). The greenstones consist of amphibolite-grade mafic metavolcanic rocks, mafic intrusions and intercalated metasediments. Mafic metavolcanic rocks form flows, pillowed flows or tuffs. Garnets are locally abundant, developed preferentially along smaller pillow selvedges.

Sedimentary and mafic volcanic units host iron formation. Within sediments, iron formation varies from magnetite-quartz banded, to a unit with remnant magnetite-quartz layering replaced by pyrrhotite-magnetite-quartz, with secondary oxides and local pyrite, actinolite and garnet. In the east (Prospecting Permit 1109), iron formations are related to shearing and structural deformation.

Quartzite, resembling Hurwitz Group quartzite, at the contact of a prominent gossan zone, strikes east to southeast in the northwest portion of Prospecting Permit 1108. Meta-arkose is in a south-trending belt of mafic volcanics in the central part of Prospecting Permit 1108, in an east-striking belt of sediments in the northern part of the permit and in a northeast-striking belt of volcanics and sediments in Prospecting Permits 1109 and 1112.

The entire assemblage (with the exception of a few younger granitic plugs) is well foliated and trends northeasterly. Supracrustal rocks are metamorphosed to amphibolite grade.

CURRENT WORK AND RESULTS

In 1986, Comaplex Resources Inc. acquired Prospecting Permits 1108 and 1109. Prospecting Permit 1112 was issued in the following year.

During 1986, reconnaissance geological mapping, prospecting and rock sampling was performed over Prospecting Permits 1108 and 1109, as well as east of Prospecting Permit 1109. Three favourable environments for gold were identified: sulphide-facies iron formation; west-northwest- to north-northwest-trending shear zones or structural deformation zones hosting quartz and dolomite veining; and rusty or silica-rich zones, at or near lithological contacts. These environments yielded high gold concentrations of up to 23.6 ppm for quartz vein samples and 8.3 ppm from a shear zone within amphibolite. Seven of twelve samples taken from an extensive iron formation, 3.5 km in length and 6 to 20 m in width, were anomalous in gold. The highest gold assay was 2.6 ppm. The iron formation contains arsenopyrite, with minor pyrite and pyrrhotite, locally admixed with chlorite and sericite in a siliceous matrix. Of the 66 rock samples collected from all environments, 27 were anomalous in gold.

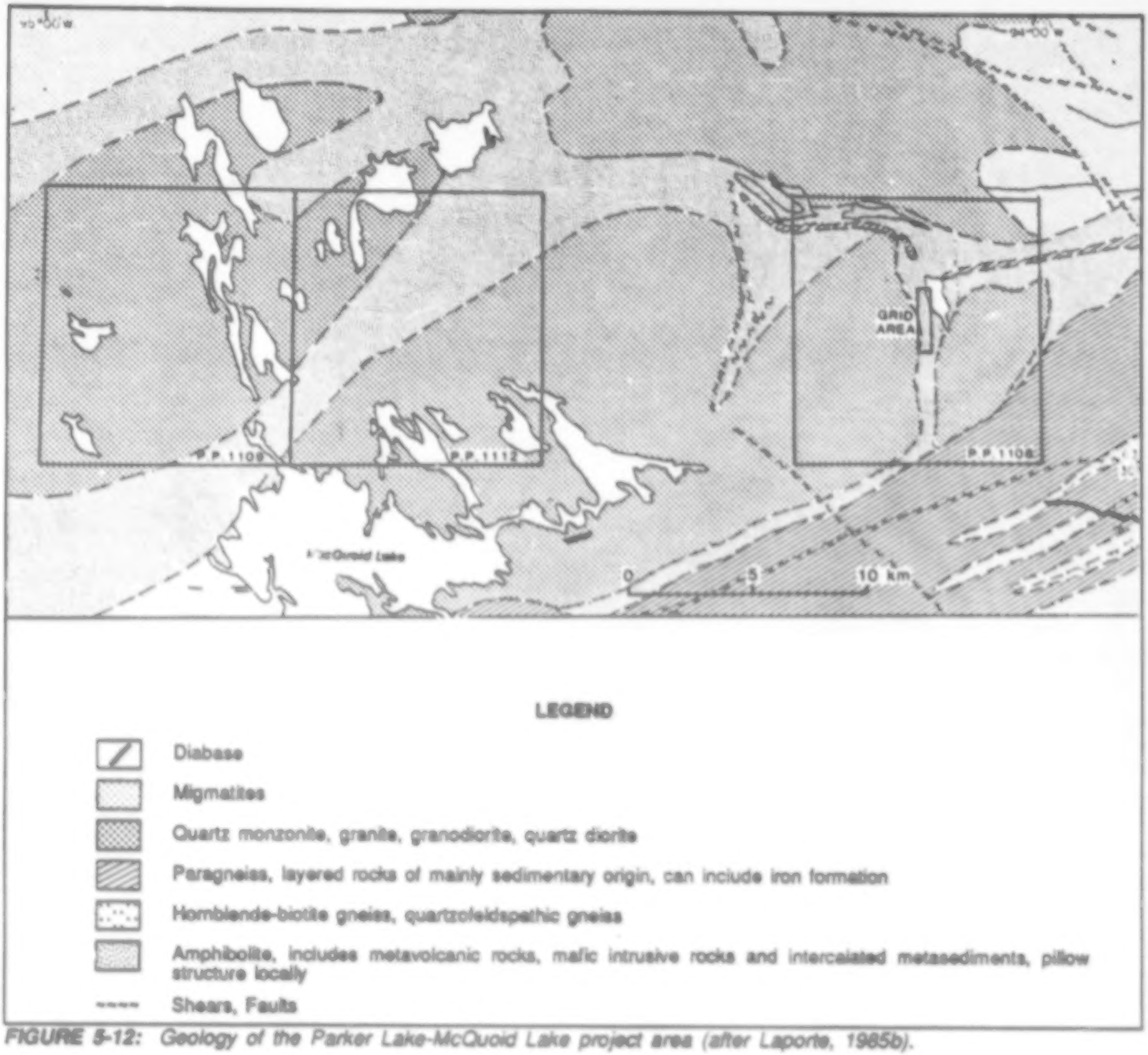
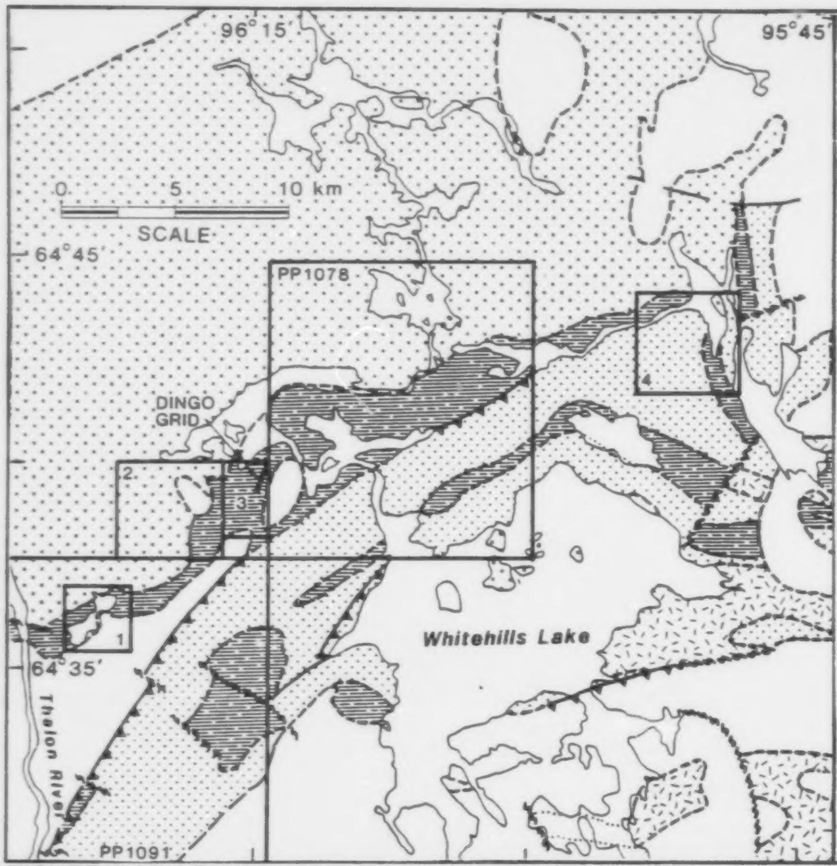

94°00'W
GRID AREA
P.P. 1108
P.P. 1112
P.P. 1108
McQuoid Lake
0
5
10 km
LEGEND
Diabase
Migmatites
Quartz monzonite, granite, granodiorite, quartz diorite
Paragneiss, layered rocks of mainly sedimentary origin, can include iron formation
Hornblende-biotite gneiss, quartzofeldspathic gneiss
Amphibolite, includes metavolcanic rocks, mafic intrusive rocks and intercalated metasediments, pillow structure locally
Shears, Faults

FIGURE 5-12: Geology of the Parker Lake-McQuoid Lake project area (after Laporte, 1985b).

In 1987 a 25.5 km grid, with 100 m line spacing, was established over the auriferous iron formation. The grid was used as control for detailed geological mapping and channel sampling. A total of 60 samples, including eleven channel samples, were collected from the grid area. Forty-six samples were anomalous in gold and 16 ranged from greater than 500 ppb to 44.4 ppm Au. White vuggy quartz veins; sheared, chloritized contacts with meta-basalt and strongly gossanized zones within the iron formation were associated with elevated gold content.

Reconnaissance mapping, sampling and prospecting was done outside the gridded area on Prospecting Permit 1108 and throughout the entire area of Prospecting Permit 1112. Assays of up to 16 ppm Au were obtained from iron formation on Prospecting Permit 1112. Four gold showings were discovered on Prospecting Permit 1108. The highest assay from a gossan sample bearing abundant pyrite and pyrrhotite was 21.4 ppm Au. Three samples taken from a quartz-veined shear zone, 0.1 to 23 m wide, with a strike length of 1 km, assayed between 1.8 and 7.4 ppm Au. Amphibolite samples collected near a granite contact yielded 1.9 to 23.8 ppm Au and up to 0.23% Cu, 10.6% Zn, 5.3% Pb and 1060 ppm Ag. The zone contains chalcopyrite, sphalerite, galena, pyrite and trace pyrrhotite in silicified dolomotized shear zones. A sample of rusty silicified zone within basalt, hosting veins and lenses of arsenopyrite, pyrite and pyrrhotite, assayed 4 ppm Au. The highest base metal concentrations were obtained from a gabbro dyke, which yielded 1.04% Cu, 810 ppm Ni, 15.8 ppm Ag and 686 ppb Au.



KEY TO CLAIMS IN FIGURES 5-13 & 5-14

BAKER LAKE PROJECT

1	MCLEOD
2	ALLEN 1 & 2
3	OLIVIA
4	JEAN 1 & 2
5	MO
6	SH
7	ER
8	CAREY
9	DICK
10	DEVIN
11	CHRIS
12	MAUD
13	WEBSTER
14	HAZEL
15	MUFFIN
16	HAS
17	MOON 1-2
18	SON
19	SELL 1 & 2
20	DONNA
21	AND
22	REA
23	LETISHA 1 & 3
24	NI 1 & 2
25	LA
26	LEI

FIGURE 5-13: Geology, permits and claims of the Whitehills Lake area (after Laporte, 1985b).

LEGEND FOR FIGURES 5-13 & 5-14 – BAKER LAKE PROJECT

LEGEND

☐ Undifferentiated Aphebian and Archean Intrusives

WOODBURN LAKE GROUP

░ White orthoquartzite, quartz-mica schist

▒ Greywacke, chlorite schist, minor laminated chert and carbonate

▓ Ultramafic rocks, basaltic and peridotitic komatiites, spinifex textured flows, minor felsic metavolcanics and layered volcanic rocks

▤ Felsic to intermediate tuffs, flows and shallow intrusive rocks, rhyolite porphyry

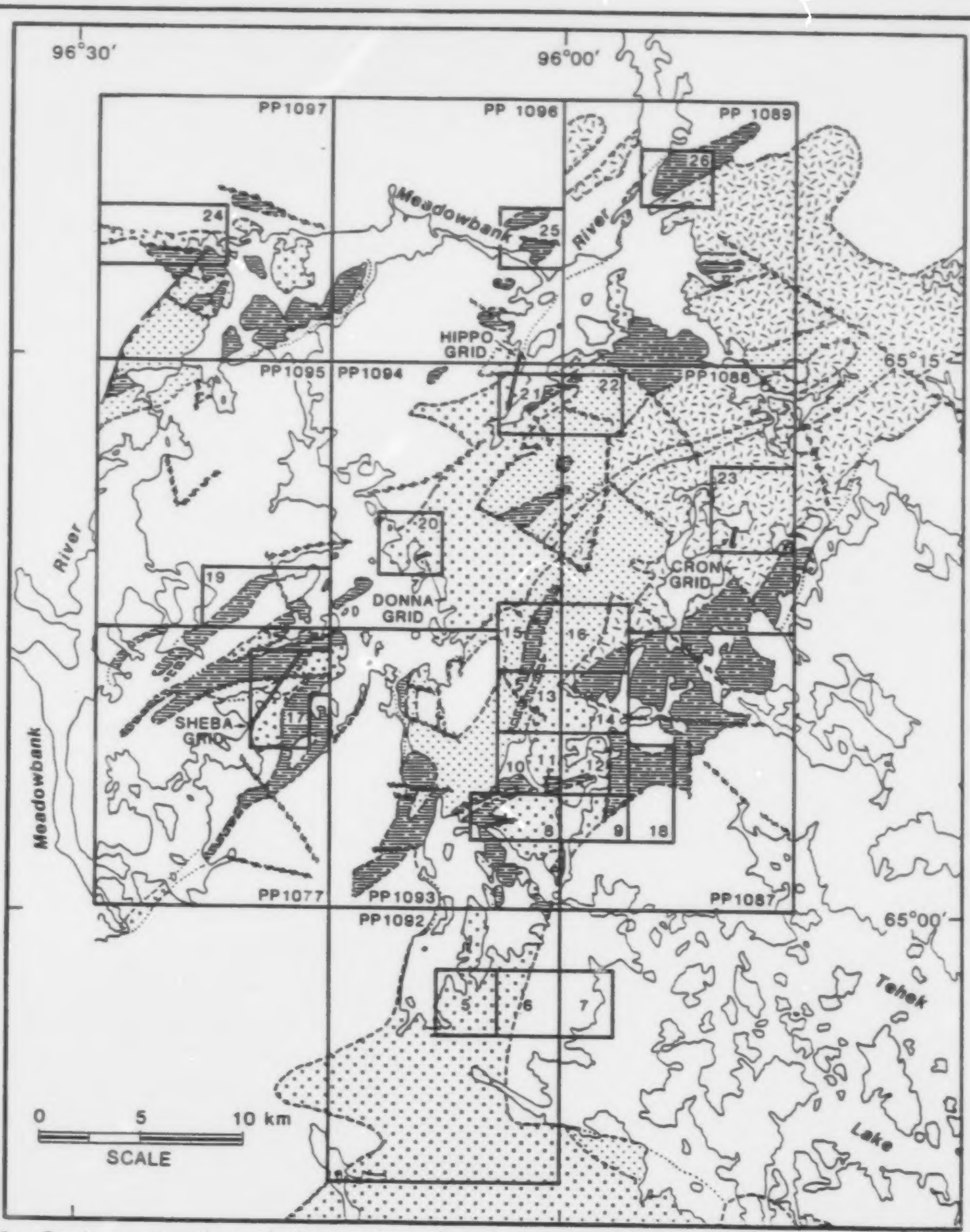
KETYET RIVER GROUP

▨ Slate, shale, phyllite, metasiltstone and biotite schist

▤ Mafic volcanic flows, breccias and intrusions, volcanogenic sediments

SYMBOLS

Geological Contact
Fault
Thrust Fault



96°30′
96°00′
65°15′
65°00′
PP1097
PP 1096
PP 1089
PP1095
PP1094
PP1088
PP1077
PP1093
PP1092
PP1087
Meadowbank River
Meadowbank
River
HIPPO GRID
DONNA GRID
CRON GRID
SHEBA GRID
Tehek Lake
0 5 10 km
SCALE

FIGURE 5-14: Geology, permits and claims of the Tehek Lake area (after Laporte, 1985b).

BAKER LAKE PROJECT

Comaplex Resources Corp.	Gold
901, 105 4th St. SW	56 E; 66 A,H
Calgary, Alta., T2R 1J4	63°00'-65°45'N
	96°45'-97°30'W

REFERENCES

Ashton (1982); Laporte (1983b, 1987); Wright (1967).

DIAND assessment reports: 060660, 081100, 082101, 082136, 082535, 082688.

PROPERTY

The prospecting permits and claims are listed on Figures 5-13 and 5-14.

LOCATION

The property is approximately 115 km north of the town of Baker Lake. The claims and permits cover three separate areas; immediately north-northwest of Tehek Lake, immediately northwest of Whitehills Lake, and the MOON claims are approximately 35 km south of Schultz Lake (Figs. 5-13, 5-14, 5-15).

HISTORY

Past attention by companies, including Urangesellschaft, Metallgesellshaft, Aquitaine and Central Del Rio Oils Ltd., has been devoted to the uranium potential of the Baker Lake Project area. During uranium exploration by Essex Minerals in

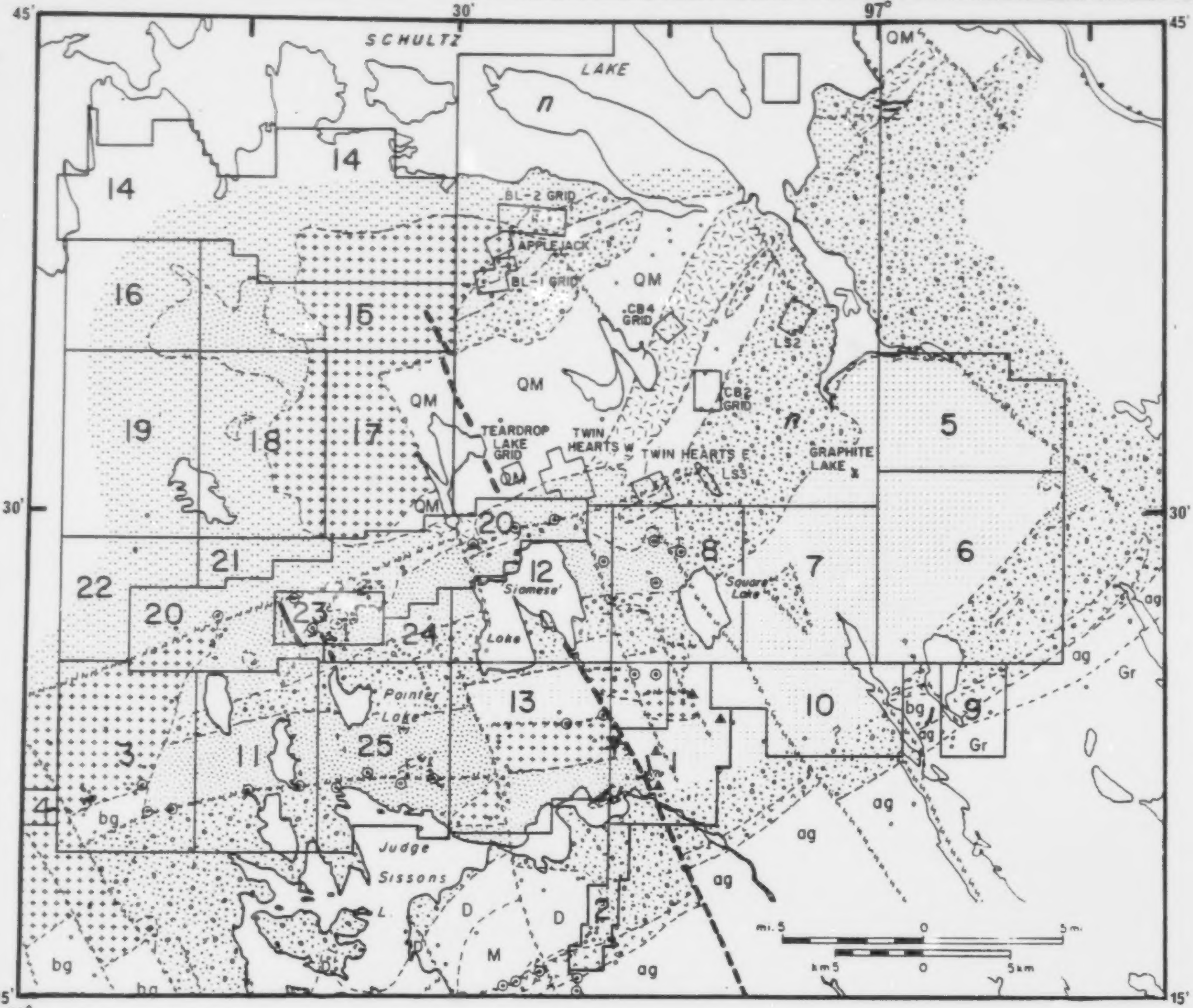

45'
30'
97°
45'
SCHULTZ
LAKE
QM
n
14
14
BL-2 GRID
APPLEJACK
BL-1 GRID
QM
CB4 GRID
LS2
16
15
19
18
17
QM
QM
TEARDROP LAKE GRID
TWIN HEARTS W
TWIN HEARTS E
CB2 GRID
LS3
GRAPHITE LAKE
5
30'
30'
QM
20
12
Siamese
Lake
8
Square Lake
7
6
21
22
20
23
24
ag
Gr
13
Pointer Lake
10
bg
ag
9
Gr
3
11
25
1
4
bg
ag
ag
Judge
Sissons
L.
ag
D
D
M
2
ag
bg
bg
mi. 5
0
5 mi.
km 5
0
5 km
64° 15'
98°
15'

FIGURE 5-15: Geology and properties, Schultz Lake and Judge Sissons Lake areas (geology mapped and compiled by P.J. Laporte).

1979, an iron-rich gossan, 61 m in strike length, was discovered in an area corresponding to the current SELL claims. Fuchsite was noted in the area. A VLF conductor supports the interpretation of a 3.2 km strike length to the gossan. Soil samples collected over metavolcanics contained 1 ppb to 25 ppb Au.

From 1969 to 1972 the area west of Whitehills was held by Ensign Oil Ltd. and Fort Reliance Minerals Ltd. as Prospecting Permit 93. The north part of the Whitehills area was held by Hudson's Bay Oil and Gas Company Ltd. between 1981 and 1983 as Prospecting Permits 753 and 754. Both companies conducted airborne and ground geophysical and geological surveys. Ensign Oil and Fort Reliance Minerals outlined 29 conductors in the area. In 1969, Surveymin Ltd. performed work on Prospecting Permit 93. Iron formation was found and the highest assays from three samples taken approximately 8 km west of Whitehills Lake were 6.0% Pb, 1.9% Zn, 0.09% Cu, 0.1% Ni, 4.1 ppm Au and 17 ppm Ag.

The Phoenix prospect was staked by Comaplex in 1979 to cover a conductor outlined during a 1969 airborne survey. An agreement between Comaplex and a joint venture partner failed to be formalized and the claims lapsed. Between 1983 and 1986, the area of interest expanded and Comaplex acquired prospecting permits and claims covering the areas outlined in Figures 5-13 and 5-14 and the Phoenix prospect was restaked as MOON 2 to 6. Work in the project area in 1983 and 1984 identified four showings on Prospecting Permit 1077 and one west of Whitehills Lake. The most significant was the Sheba showing, on Prospecting Permit 1077, now covered by MOON 1, where average assays of 7.36 ppm Au were obtained from 75 samples of quartz-veined quartz-eye porphyry (Laporte, 1987).

LEGEND for Figure 5-15

HELIKIAN

	Diabase dykes

DUBAWNT GROUP

⬚	Thelon Formation: conglomerate and sandstone
⊙	Quartz-hematite breccia

APHEBIAN

✚	Fluorite-bearing granite, syenite

ARCHEAN(?)

M	Monzonite
D	Diorite
ag	Augen gneiss
Gr	Quartz diorite to granodiorite
bg	Biotite gneiss (derived from sediments)
a	Amphibolite (derived from mafic volcanics and dykes)
▨	Felsic flows and tuffs
⬚	Orthoquartzite, laminated, sericitic and pyritic quartzite, quartz phyllite.
▨	'Dirty quartzites': arkosic to lithic arenites, biotite and/or almandine gneiss, quartz arenite, mica schist
■	Dolomitic carbonate rock
▨	Greywacke, lithic greywacke, arkosic wacke, subgreywacke (include some 'dirty' quartzites)
⬚	Massive to pillowed mafic volcanics
●	data/sample collection point (P.J. Laporte)
▲	Zones of mineralization on SAM claims

GIANT YELLOWKNIFE MINES

1: SAM 1-5

COMAPLEX

2: MOON 1-6

URANGESELLSCHAFT

3:	BILA 1-8	14:	IT 1-591; KF 8-9[1] 78 SCH[1]:
4:	BS 5		
5:	COO 1-8[1]	15:	AJOL 1-8[1]
6:	LA 1-12[1]	16:	WUNZ 1-6
7:	DOVA 108	17:	MAN 1-8
8:	SHAY 1-8[1]	18:	WAG 1-8
9:	LAST 7, 8	19:	LYS 1-8
10:	LAST 2-5; TREE 4	21:	PED 1-4
11:	BONG 1-8	22:	CAM 1-6
12:	OTHA 1-8	24:	BYA 3-6
13:	BAR 1-10	25:	UND 1-8[1]

Lone Gull Deposit

20:	L 1-620	23:	SSL 1-128

PNC EXPLORATION - n: F 5-13

[1] partly lapsed from 1984 - 1987

DESCRIPTION

The Baker Lake Project area is underlain by a broad, northeasterly trending supracrustal belt (Fig. 5-13), separated at the west end of Tehek Lake by intervening gneissic terrain (Laporte, 1985b; Wright, 1967).

The supracrustal rocks, mapped as the Woodburn Lake group, can be subdivided into two main groups consisting of volcanics with associated sediments and quartzites (Ashton, 1982). Felsic to intermediate flows, tuffs and rhyolite porphyry; mafic volcanic flows, breccias and intrusions with volcaniclastic sediments grade into basaltic and peridotitic komatiites with spinifex textured flows. The volcanic rocks are overlain by slates, shales and greywackes and their metamorphosed equivalents (Laporte, 1985b).

The relationship of the quartzite to the volcanics and sediments is not understood. The quartzite could be tectonically emplaced and thus older or younger than the volcanics and sediments (Laporte, 1987). Contacts between the quartzites and metavolcanics are represented by chlorite schists that suggest the presence of low angle faults, but quartzite pebbles are found in sediments overlying, and grading into, the volcanic sequence which would indicate that the quartzites predate the volcanics (Ashton, 1982).

Oxide- and sulphide-facies iron formation are hosted by the sediments, proximal to the volcanics (Laporte, 1987). Sulphide and carbonate facies have been recognized by Asamera workers (DIAND assessment report 082688). In the Whitehills Lake area, layers of iron formation extend from the Thelon River to the northeast shore of the lake (Laporte, 1985b). Iron formation is also abundant northwest of Tehek Lake (Ashton, 1982).

The supracrustals and derived gneisses have been intruded by Archean granodiorites, gabbros and peridotites and Aphebian granites and syenites. In the Whitehills Lake area, a northeasterly trending supracrustal belt is locally bounded by thrust faulting and warped by the intrusion of the Tehek Lake Plutonic complex into a south-trending antiform (Fig. 5-14). Between Tehek Lake and Meadowbank River, the supracrustals are approximately northeasterly trending, but are disrupted by numerous fault sets trending northwesterly and easterly (Laporte, 1985b).

In 1985, sampling by Laporte (1985b) defined seven distinct areas that yielded anomalous gold results, six of which are covered by claims and permits of the Baker Lake Project.

CURRENT WORK AND RESULTS

In 1986, exploration included reconnaissance mapping and prospecting. Seven grids were established with an aggregate total of 22.7 km baselines and 156.4 km winglines. Grid details are summarized in Table 5-2 and locations are indicated on Figures 5-13 and 5-14. Detailed mapping, geochemical sampling and geophysical surveys were conducted on the grids. A total of 2642 m of diamond drilling was carried out on two gold showings.

In 1986, reconnaissance mapping and sampling was carried out over 12 prospecting permits. Gold-bearing samples, from the 729 samples collected, cluster into two roughly parallel broad belts approximately 22 km in length, partially separated by a portion of the Tehek Lake intrusive complex. The more northerly belt contains the Sheba, Jan, Tanzin, Donna and Hippo showings and the southerly belt contains the Horace, TR, Wally World, Long Root and Ron showings (Fig. 5-13). The Calvin base metals showing is north of the belts on the NI claims.

In 1986 ground geophysical surveys were conducted on the Sheba, Phoenix, Ron and Dingo grids by Geoterrex Ltd. Survey types are summarized in Table 5-3. The surveys were unsuccessful in locating significant anomalies on the Sheba grid. Strong VLF conductors detected on the Phoenix grid correlated with an airborne EM conductor. Some magnetic features were delineated on the Dingo grid, but did not help define the granite contact. Strong anomalies on the Ron grid had not yet been correlated to surface showings.

Detailed grids covered the main Sheba showing, as well as the Jan, Stoney and Tazin showings. The main Sheba zone consists of quartz-sericite schists within a sequence of rhyolites that host gossans containing base metals and gold. The zones have a geochemical expression, but no geophysical expression. In 1986, a total of 1776 m of diamond drilling in 15 holes tested three zones of en-echelon shears and a geochemical anomaly. Narrow multiple intersections were recovered with a best intersection of 133 ppm Au over 0.2 m.

TABLE 5-2: GRID DETAILS, BAKER LAKE PROJECT (DIAND assessment report 082136)

GRID	BASELINE ORIENTATION	GRID SIZE	SPACING (m) line/station
Sheba Regional	038°	66.6	100/25
Sheba Detail	038°	9.85	25/25
Phoenix	017°	57.4	100+200/25
Ron	010°	9.3	50/25
Dingo	028°	19.6	100/25
Wally World	025°	4.51	irregular/25
Donna	059°	3.95	100/25
Hippo	010°	7.93	irregular/50

TABLE 5-3: SURVEY COVERAGE BY GRID AND METHOD

(DIAND assessment report 082101)

	PROPERTY			
SURVEY	Sheba	Phoenix	Dingo	Ron
MAG	64.6 km	67 km	19.9 km	6.0 km
VLF	65.6 km	58.9 km*	-	8.5 km
GRAD	54.35 km	5.65 km	-	-

The Sheba North showing, quartz-carbonate veinlets and zones of sericite schist within interlayered volcaniclastics and felsic tuffs, was tested in 1986 by 217 m of diamond drilling in three holes. Thin patchy sulphides were recovered with one anomalous gold assay of 1.1 ppm Au.

Exploration on the Phoenix showing was designed to test an airborne geophysical anomaly. Quartz-sericite schists and chloritic schists with up to 3% pyrite were sampled, but failed to yield economic gold concentrations. Similar schists to the north of the property (the SAM claims) contain up to 10% sulphides and 19 ppm Au.

In 1987, a Landsat study, an airborne multisensor survey, regional prospecting and further evaluation of gold showings discovered during 1986 was undertaken.

In 1987, 44.5 km of Max-Min was conducted on the Phoenix grid to define the axis, depth, width and dip of an EM conductor that does not outcrop. The conductor was drill tested for a strike length of 8 km by 1992 m of drilling in 19 holes. Nine hundred and twenty-four core samples averaging 1 m in length were analyzed for gold and silver, but did contain economic grades.

On the Dingo grid, a 6 m wide auriferous quartz vein, at the contact between a granodiorite stock and gabbro-peridotite ring dyke, was evaluated. A sample of chalcopyrite- and bismuthinite-bearing quartz assayed 3 ppm Au.

The showing on the Ron grid is a zone of gold- and arsenopyrite-bearing quartz veins within felsenmeer. A series of veins were outlined over an area 160 m long by 50 m wide. Assays of up to 33 ppm Au were yielded by quartz samples. The zone was drill tested by 475 m in four holes. Low grades across narrow widths were intersected.

The Hippo grid was established to follow up on gold-bearing grab samples. Two zones of narrow auriferous quartz veins were discovered. One zone, a pyrite- and arsenopyrite-bearing gossan with up to 10 ppm Au, coincides with VLF and geochemical anomalies. The second zone produced an assay of 72 ppm from a quartzite-hosted argillic, quartz-veined interbed with apparent widths of 10 to 20 cm.

A series of sulphide lenses, veins and extensive pyrite- and pyrrhotite-bearing gossans in alternating rhyolite and ultramafic flows underlying the Donna grid were sampled during 1986 and assayed up to 5 ppm Au. In 1987, grab and channel sampling failed to return significant results.

The Wally World Trend was delineated and examined during 1986 and 1987 field work. Twenty-nine gold showings were found along a northeast-striking belt of intermediate to mafic tuffs with intercalated iron formations and metasediments. A structural break was interpreted in the centre of the trend that hosts almost half of the showings (Fig. 5-16), although no correlation between faulting and gold content was observed. A grid was established in 1986 to cover an area of gold-bearing grab samples. Grid surveys detected a number of showings over a discontinuous strike length of 10 km. The showings were examined in more detail during the 1987 field season. The Long Root, Wally World and Cricket showings are quartz-carbonate veins. Trenching and channel sampling on the Long Root and Wally World showings failed to reveal a bedrock source for the gold. A channel sample collected at the Cricket Occurrence assayed 2.6 ppm Au over 1.2 m. The TR1 and Tern Lake Occurrences are discontinuous pods of quartz and a quartz vein up to 50 cm wide respectively.

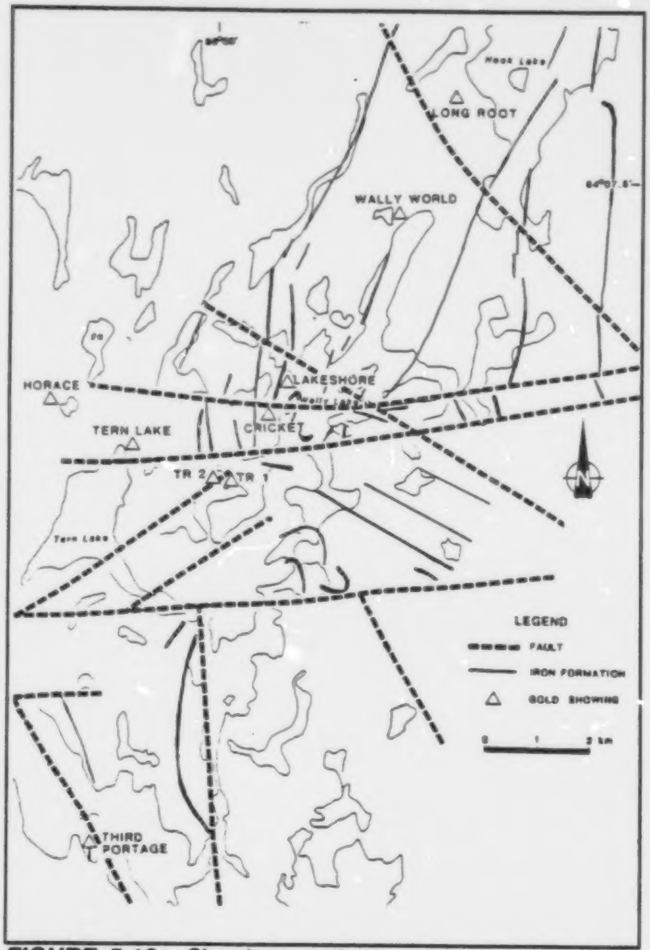


FIGURE 5-16: Showings and structural elements of the Wally World Trend (from DIAND assessment report 082688).

Samples from the Tern Lake Occurrence assayed up to 148 ppm Au and 1061 ppm Ag. Sulphidic samples of oxide-facies iron formation from the Third Portage Lake Occurrence (discovered late in the 1987 field season) contained anomalous amounts of gold in 6 of the 17 grab samples taken. The highest assay for the Third Portage Lake Occurrence was 19.6 ppm Au.

Three types of showings at the TR2 Occurrence are spatially related to a quartz-feldspar porphyry contact. The three types are: pyritic siliceous bands in micaceous argillite; siliceous bands within quartz-feldspar porphyry; and deformed oxide-facies iron formation surrounded by quartz-feldspar porphyry. Assays of up to 81.4 ppm Au were obtained from the first type.

The Calvin East showing was found late in the 1986 field season. Samples taken at the time from a base metal-bearing quartz vein contained up to 7.4 ppm Au. Channel sampling and trenching in 1987 failed to reproduce the 1986 results.

Four of the seventeen samples taken from the Horace showing during the 1986 field season assayed greater than 1 ppm Au, with a high assay of 3.8 ppm Au. Gold was hosted by sheared siliceous sericitic quartzite, containing up to 5% combined galena and chalcopyrite. The showing was evaluated in 1987 by gridding, mapping, channel sampling and VLF surveys, which failed to yield significant results.

SCHULTZ LAKE PROJECT

PNC Exploration Co. Ltd	Uranium
2401 - 650 W Georgia	65 A/11
Vancouver, B.C., V6V 4N8	64°42'N, 97°15'W

REFERENCES

Laporte (1983b, 1984, 1987).
DIAND assessment reports: 082359, 082507.

PROPERTY

F 5-13 (F01462-F01470).
F 15-50 (F01472-F01507).
F 51-59 (F07678-F07686).
F 60-68 (F01285-F01293).
F 69-77 (F09970-F09977).

LOCATION

The claims are south of Schultz Lake (Fig. 5-15).

HISTORY

In 1969 and 1970 Aquitane flew radiometric and magnetometer surveys revealing two anomalous areas on the east central portion of 66 A/11 (Prospecting Permit 163). In 1970, an airborne EM and magnetometer survey outlined three EM conductors on Prospecting Permit 163, but no further work was done and the permits were relinquished.

In 1978 BP minerals acquired Prospecting Permits 533-536. Airborne radiometric, VLF EM and magnetic surveys covered 2045 line-km with 320 m line spacing (Laporte, 1983a). Lake sediment and soil sampling, mapping and prospecting in 1979, delineated three showings. One was an outcrop of radioactive Thelon Formation conglomerate containing 185 ppm U_3O_8, that is now covered by the Twin Hearts grid. Another was quartz pebble conglomerate in Aphebian sediments (Graphite Lake) and the third showing, now known as the Boni Lake Boulder Train, is 1.5 by 0.5 km, comprising 100 boulders of radioactive meta-arkose with up to 0.52% U_3O_8. Grids were established over the showings and geological, geochemical, VLF EM and radiometric surveys were conducted (Laporte, 1983b).

In 1980, 2735 line-km of INPUT and magnetometer surveys was flown at 200 m line spacing. The surveys delineated strong conductors in the Graphite Lake and Twin Hearts areas (Fig. 5-15). The Boot Lake grid was established and subsequent geological and geophysical surveys defined uranium soil anomalies (DIAND assessment report 082507).

From 1980 to 1981, 3091 m in 31 holes was drilled to test radioactive conglomerate in the area of VLF EM, INPUT and Max-Min conductors. Radioactivity encountered in the core was related to thorium-rich dykes and phosphate-rich Thelon Formation sandstone (Laporte, 1984).

In 1981, the permits were converted to claims and the property lay idle from 1982 until 1986 when PNC Exploration, in joint venture with BP, became the operator for the project.

GEOLOGY

The property is underlain by a northeasterly trending belt of supracrustal rocks. Archean sediments and metasediments are in fault contact (DIAND assessment report 082507) with quartz monzonite that occupies a belt in the central portion of the property. Pyrite + chlorite ± fluorite ± uranium line fractures in the monzonite and in meta-arkose near the contact. The Archean rocks are intruded by Aphebian fluorite-bearing syenite and granite at the west central boundary of the property. Thelon Formation conglomerate and sandstone of the Dubawnt Group unconformably overlie the Archean rocks (Laporte, 1987).

CURRENT WORK AND RESULTS

The objective of the regional work in 1986 was to identify Kiggavik-type deposits. Early in the 1986 season, a DIGHEM multi-sensor survey was flown over the property covering 1000 line-km at 250 m spacing. A number of resistivity lows were detected, including a major low, 1 km south of the "Applejack" boulder train showing delineated by BP (Fig. 5-15). An additional 252 line-km at 250 m spacing was surveyed during 1987. A number of resistivity lows related to easterly trending VLF anomalies were detected.

A total of 161 lake sediment samples were collected, completing the lake sediments surveys of the property started in 1979. Three anomalous zones were found, one extending west from Graphite Lake, one between Graphite Lake and the Central belts and a third in the area of Twin Heart Lakes (Fig. 5-15). In 1987, pulps from the 1979 and 1986 sampling were submitted for multi-element (30) analysis. Nine anomalies were outlined.

Three areas with poorly defined resistivity lows and lake sediment anomalies were targeted for follow-up work (Fig. 5-15). 16.8 km of scintillometer, mapping and soil surveys was completed on the LS2 grid. Control lines were established on the Applejack boulder train for prospecting and LS3 grid was examined during one traverse. Two radioactive boulders found in the Applejack area assayed 2200 and 3600 ppm U. On the LS2 grid uranium-in-soil anomalies are associated with copper-in-soil anomalies.

Regional mapping and sampling, with concurrent scintillometer surveys, tested areas considered to be geologically similar to the Kiggavik deposit: The Boot Lake grid, the Central grid and the Graphite grid. Based on the work, the following table of formations was proposed.

Drill core from 1980-81 drilling on the Twin Hearts grid was re-examined in 1986 to further define the geology and structure of the area.

In 1986 the 7.2 km "Uno grid" (in the area of the BL1 grid) with 200 m line spacing and 50 m station intervals was established over the area of low resistivity defined by the airborne survey (Fig. 5-15). Ground EM, magnetic and scintillometer surveys attempted to pinpoint the area of low resistivity. There is good correlation between the anomalies defined by airborne surveys and by ground surveys.

During 1987, a series of grids with 100 m line spacing and 50 m station intervals were established. VLF, EM-16R, magnetometer, gravity, Max-Min and "C" horizon soil sampling with concurrent scintillometer surveys were conducted on the BL1, BL2, Twin Hearts East, Twin Hearts West, CB2, CB4 and Teardrop grids. Nine zones were outlined and prioritized.

Two zones were considered of primary importance. On BL1, several soil anomalies with concentrations of up to 19.7 ppm U were outlined and a linear zone, 1800 by 500 m, of low resistivity, magnetic contrast and gravity was defined. A gravity and resistivity low and weak EM conductor was outlined on the Twin Hearts East grid. The zone is hematized greywacke close to an unconformity between Thelon Formation and basement rocks.

TABLE 5-4: TABLE OF FORMATIONS, SCHULTZ LAKE AREA

NEOHELIKIAN

Diabase & Gabbro

HELIKIAN

Thelon Formation
- siltstone
- sandstone
- conglomerate

----------Unconformity----------

APHEBIAN

Dubawnt Group
- Christopher Island Syenite Dykes

Fluorite-bearing Granite and Quartz Monzonite
- Massive Granite
- Porphyry

APHEBIAN?ARCHEAN?

Felsic and Intermediate Volcanics
- quartz latite
- rhyolite
- dacite
- andesite

Graphite Chlorite Schist

Quartzite
- orthoquartzite
- sericite orthoquartzite
- impure quartzite

Clastic Metasediments
- arkose
- quartz biotite schist
- amphibolite
- greywacke

ARCHEAN

Foliated Quartz Monzonite

SAM CLAIMS

E.A. Gallo	Gold
148 Allanhurst Dr.	66 A/6
Islington, Ont., M9A 4K7	64°22.5'N, 97°15'W

REFERENCES

DIAND assessment reports: 082633, 061352, 081070, 081356.

PROPERTY

SAM 1-5 (F12293-F12297).

LOCATION

The property is 8 km east-northeast of Judge Sissons Lake, approximately 60 km west of the town of Baker Lake (Fig. 5-15).

HISTORY

In 1969, Central Del Rio Oils Ltd. contracted Questor to fly an airborne geophysical survey. A magnetic anomaly was delineated, trending northeast from Judge Sissons Lake, that was later related to an iron formation. Two north-northeast-trending INPUT anomalies were detected near the southwest corner of the SAM claims.

Metallgesellshaft held the area of the SAM claims in the early 1970s under Prospecting Permit 319 and found an iron formation layer hosting disseminated chalcopyrite immediately north of Judge Sissons Lake.

During 1980 exploration south of Judge Sissons Lake, Comaplex sampled two sulphide-bearing boulders that yielded 4.1 ppm Au and 109 ppm Ag. During the same field season, Cominco workers found beds of iron formation on an island in Judge Sissons Lake and on the eastern shoreline of the lake. Oxide, sulphide and silicate facies 2 m wide was traced for a strike length of 400 m.

In 1981, Urangesellschaft flew VLF EM and magnetometer surveys over the area of the SAM claims and delineated several northwest-trending VLF EM conductors.

The SAM claims were staked in 1986 to cover the areas where samples, collected by S. Surmacz in 1985, assayed up to 159 ppm Au. In 1987, the claims were optioned to Pamorex Minerals Inc. who carried out the exploration described in this section.

DESCRIPTION

The claims are at the south edge of the belt of supracrustal rocks trending from Judge Sissons Lake to Tehek Lake. The Archean rocks are mafic to intermediate tuffs, now represented in places by chlorite schists and metasediments ranging from graphitic slates to greywackes and quartzites. The rocks are overlain by Aphebian metasediments and intruded by a northwest-trending swarm of Hadrynian diabase dykes.

CURRENT WORK AND RESULTS

Regional geological mapping at 1:10 000 identified five zones of interest. In the Big Sam North and the Intrusive Shear zones, gold is associated with polymetallic quartz veins. At the Big Sam North zone, the vein system hosts galena, sphalerite and chalcopyrite. Grab samples assayed up to 1.7 ppm Au. Quartz veins in the Intrusive Shear zone contain arsenopyrite, pyrite, sphalerite and galena. Maximum assays were 119 ppm Au, 100 ppm Ag, 2.1% Pb, 17% Zn and 0.089% Cu.

The Big Sam East zone is rusty quartz boulders in a gossanous frost boil found over a length of 25 m. Gold assays from boulder samples range from 5.1 to 9.4 ppm Au.

The River zone is gritty pyrite in dolomitic and cherty banded rock with minor chalcopyrite, covellite and malachite. Assays for samples collected from pinch and swell quartz veinlets with abundant arsenopyrite and pyrite and siliceous chlorite schist with bands of disseminated pyrite and associated fine-grained gold, ranged from 0.17 to 0.79 ppm Au. Results of detailed mapping indicate that the auriferous zones lie within a shear or fault zone.

A DIGHEM III multisensor (electromagnetic/resistivity/magnetic/VLF) survey totalling 488 line-km was flown with 100 m spacing during July, 1987. Results of the survey were unsuccessful, but the magnetic survey was used to delineate units of iron formation.

SISSONS-SCHULTZ PROJECT

Urangesellschaft
Suite 2812, T-D Tower
P.O. Box 19
Toronto-Dominion Centre
Toronto, Ont., M5K 1A1

Uranium
66 A/5,6,7,10,12; B/8
64°30'N, 97°30'W

REFERENCES

Laporte (1987); Urangesellschaft (1989).
DIAND assessment reports: 082272, 082417, 082623.

PROPERTY

Sissons-Schultz South:
  SHAY 5 - B 71397.
  SHAY 6 - B 71398.
  BILA 3 - B 71370.
  TREE 4 - B 71413.
  Dormant are claims listed on Figure 5-15.
Kiggavik (Lone Gull):
  L 1 to L 620.
  SSL 1 to SSL 128.

LOCATION

The Sissons-Schultz project area extends north and northeast from Judge Sissons Lake to Schultz Lake and to the Thelon River and includes both the Sissons-Schultz South project (BILA, SHAM and TREE) and the Kiggavik (Lone Gull) project. The SHAY claims are 15 km northeast of Judge Sissons Lake, the BILA claims 15 km west-northwest of Judge Sissons Lake and the TREE 4 claim is approximately 20 km east-northeast of Judge Sissons Lake. The project area also includes Kiggavik deposit, formerly the Lone Gull deposit. The Kiggavik deposit is immediately north of Pointer Lake (Fig. 5-15).

HISTORY

Metallgesellschaft Canada Ltd., an affiliate of Urangesellschaft Canada Ltd., began exploring for uranium in the Keewatin during 1974. Prospecting Permits 317 to 327 were acquired to encompass the area between Judge Sissons and Schultz lakes and a radiometric survey was flown over the region. A base camp was established to investigate an anomaly (the Kiggavik deposit) and exploration expanded from that area (Urangesellschaft, 1989).

The history for all of the claims of the Sissons-Schultz project area is described by Laporte (1987) under Project K-1. Between 1978 and 1979, the claims were the subject of reconnaissance geochemical surveys, airborne VLF EM, radiometric and magnetometer surveys, geological mapping and prospecting. Numerous anomalies were outlined and 51 grids were established (Laporte, 1987).

BILA 3, SHAY 5, 6 and TREE 4 were recorded in June, 1978. The End grid was established on BILA 6 in 1979, to follow up on an airborne VLF conductor but no further work was done on the grid until 1986. Airborne resistivity lows were detected on SHAY 5 and 6 but were not examined at that time (DIAND assessment report 082272).

Diamond drilling on the Kiggavik deposit began in 1977. Between 1977 and 1985 two major zones were identified and tested. The Main zone and Centre zone were drill tested by

16 350 m in 96 holes and 5323 m in 47 holes respectively. Additional anomalies in the area were tested by an aggregate of 14 447 m of diamond drilling in 114 holes (Laporte, 1987).

DESCRIPTION

The following is summarized from Laporte's (1987) description of the regional geology of the project area. The basement rocks of the area are an augen gneiss, quartz diorite and granodiorite, overlain by volcanic massive and pillowed flows grading in the west to amphibolite and amphibolite gneiss. The volcanics are overlain by a sedimentary assemblage which includes iron formation, lithic to feldspathic greywackes, pelites, feldspathic to quartzite arenites and wackes, dolomite and calcareous siltstone. The sediments grade westward into biotite gneisses and are overlain by white orthoquartzite. The sediments and volcanics are considered to be Archean in age and are intruded by late Archean monzonite, diorite and quartz monzonite and early Aphebian fluorite-bearing biotite-granite and syenite. The youngest supracrustals are members of the Dubawnt Group and include quartz-hematite breccia and sandstone and conglomerate of the Thelon Formation.

Three generations of faults cut the belt. The dip of the rocks throughout the belt ranges from shallow to steep. The belt is considered to be an east- to northeast-trending anticline.

The End grid on BILA 6 and the Siamese East grid on SHAY 5 and 6 cover dirty quartzites of the Hurwitz Group in contact with intrusions of the Dubawnt Group. Metagreywackes are restricted to the northeast corner of the Siamese East grid. The End grid is cross-cut by an east-trending fault referred to as the North Sissons Fracture zone (DIAND assessment report 082272). The TREE claim is underlain by feldspathic arenite, greywackes, felsic tuff, gabbro and derived phyllites and sericite, muscovite, muscovite-chlorite and chlorite schists of the Aphebian Hurwitz Group. The rocks are intruded by lamprophyre dykes and a syenite intrusion in the west (DIAND assessment report 082417).

The Kiggavik deposit is hosted by arkosic or dirty quartzites and metapelites intercalated with garnetiferous impure quartzites, mafic chloritic metasediments and well laminated siliceous beds (Laporte, 1987; DIAND assessment report 082623). The metasediments are intruded by granite, quartz-feldspar porphyry, lamprophyre, syenite and diabase (Fig. 5-17; Laporte, 1987).

Ore zones are in a graben structure that trends 095° and cross-cuts a fluorite granite with well developed shear zones trending 065°. The Main zone and the Centre zone lie along the same shear zone. The Main zone comprises two cylindrically shaped ore zones plunging 25° at 065° at the fault contact between dirty quartzites in the north and a granite intrusion in the south (Urangesellschaft, 1989). The Centre zone comprises two essentially flat lying lenses above and below an orthoquartzite layer that follow the shallow dip of the orthoquartzite. (Urangesellschaft, 1989; DIAND assessment report 082623).

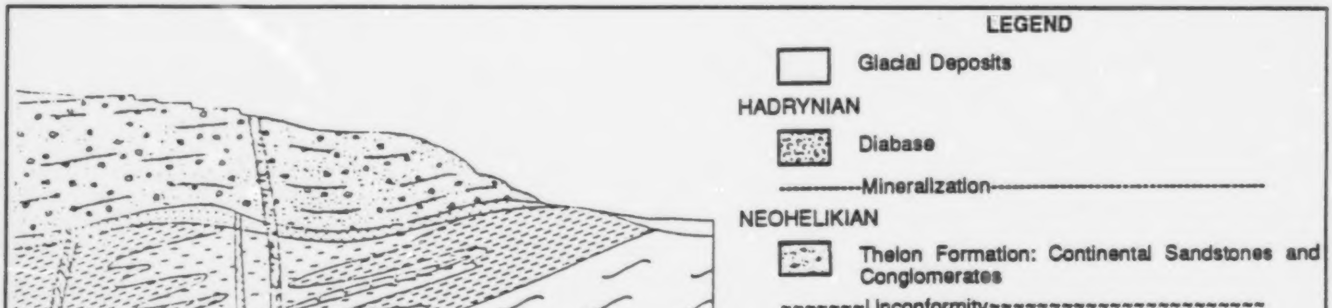

LEGEND
Glacial Deposits
HADRYNIAN
Diabase
Mineralization
NEOHELIKIAN
Thelon Formation: Continental Sandstones and Conglomerates
Unconformity
Regolith: Paleosoil or oxidation zone, developed on Aphebian/Archean? metasediments
Quartz-Feldspar-Porphyry
Syenite
Lamprophyre
Fluorite-Granite
APHEBIAN/ARCHEAN?
Hurwitz Group
Orthoquartzite
Sericite Schist
Meta-Porphyry
Meta-Arkose, Sandstone and pelite
Banded Iron Formation

FIGURE 5-17: Stratigraphy of the Kiggavik deposit (schematic, modified after Urangesellschaft, 1989).

The principal uranium mineral, coffinite, mantles and replaces pitchblende. Coffinite also forms rosettes or colloform aggregates in, or adjacent to, fractures and joints, as well as minor amounts of fine-grained disseminations throughout the host rocks. Sulphide content is less than 2% and consists of pyrite, marcasite, chalcopyrite and galena (DIAND assessment report 082623).

An alteration halo of clays (illite and sericite) replacing primary feldspars of the sediments and intrusions, boron enrichment and chloritization of mafic minerals is associated with uranium in fracture zones (Laporte, 1987). Alteration has resulted in a density decrease for the altered rocks from about 2.7 to 2.2-2.4 t/m^3 (DIAND assessment report 082623).

CURRENT WORK AND RESULTS

During 1986, work on BILA 3 (End grid) and SHAY 5 and 6 (Siamese East grid) comprised mapping, prospecting and VLF, gravity, resistivity and magnetic surveys. A strong gravity low, close to an assumed contact between dirty quartzites and intrusions, was defined on the End grid and related to a possible alteration zone. Radioactivity on the Siamese East grid was confined to hematized granitic intrusions. Geophysical surveys detected a resistivity low with coincident VLF conductor and gravity low in the central portion of the grid.

A DIGHEM IV electromagnetic survey totalling 412 line-km was flown over known areas of alteration to test the viability of the system. Alteration zones were most clearly delineated on the 56 000 Hz frequency with resistivity of between 3000 kΩ-m to 4000 kΩ-m. The Siamese East, Siamese South grids (immediately to the southwest of Siamese East) and Bar-3/Fox area (immediately to the southwest of the Siamese South grid) were surveyed. A poorly defined linear resistivity low was detected at the southwest end of the Siamese East grid.

In 1987, the TREE 4 claim was mapped and sampled. A total of 5.8 km of VLF and magnetic surveys were conducted on test lines oriented at 035°. Two strong VLF conductors were defined, one coinciding with a magnetic anomaly and syenite dyke. Mapping outlined zones of quartz-carbonate veining parallel to foliation, gossan zones and radiometrically anomalous areas in the vicinity of biotite lamprophyre and syenite dykes.

Work on the Kiggavik project area during 1986 and 1987 comprised a pre-feasibility study and further diamond drilling. In 1986, a 471 m strike length of the Main zone was tested by 54 drill holes totalling 7153 m. A regular pattern of drill holes, spaced approximately 15 m apart on 30 m sections, was adopted to facilitate geological interpretation and evaluation of grade and tonnage. The Centre zone was tested by 21 holes, spaced approximately 15 m apart on sections 15 to 20 m apart. A total of 2344 m was drilled on the Centre zone. Drilling on the Main zone and Centre zones in 1987 totalled 4095 m in 32 holes and 1238 m in 14 holes respectively.

At the end of 1987, geological reserves, recalculated using the results of the 1986 and 1987 drilling, were estimated to be 21 700 t with an average ore grade of 0.63% U_3O_8.

MARJ CLAIMS

PNC Exploration (Canada) Co. Ltd.	Uranium
2401, 650 W Georgia St.	66 B/3,6
Box 11571, Vancouver Ctr.	64°25'N, 99°23'W
Vancouver, B.C., V6B 4N8	

REFERENCES

Laporte (1974a, 1983a,b, 1987); Le Chéminant *et al.* (1983).
DIAND assessment report: 082121.

PROPERTY

MARJ 3-11 (F10345-F10353).
MARJ 12-16 (F11051-F11055).

LOCATION

The claims are 26 km south of Aberdeen Lake on the north shore of Marjorie Lake, approximately 150 km west-southwest of the Town of Baker Lake (Fig. 5-18).

HISTORY

During the 1960s, Aquitaine Company of Canada held prospecting permits covering much of the eastern portion of Aberdeen Lake and south to Marjorie Lake. Prospecting Permit 165 encompassed the area of the current claims. An airborne gamma-ray spectrometer and magnetometer survey was flown, but no strong radiometric anomalies were detected.

Between 1975 and 1980, Urangesellschaft acquired an extensive land position throughout the region and held the claim area as Prospecting Permit 354, along with the MAJ, AB and BB claims. The area was explored with airborne radiometric, VLF EM and magnetometer surveys, geological mapping, prospecting and limited stream sediment sampling. Fracture-related uranium targets were drilled in 1982 on the AB claims with no significant results.

PNC Exploration (Canada) Co. Ltd. staked MARJ 1-11 in 1983 and MARJ 12-16 in 1984. Airborne radiometrics followed by ground radiometric surveys, regional mapping, boulder prospecting and lake sediment sampling surveys were carried out during 1983 and 1984. Grids were established over an unconformity, a boulder showing and an interpreted fault (based on a geophysical survey). Detailed work on the grids included geological mapping, boulder prospecting and geophysical surveys. In 1985 detailed work on the fourth grid, established on MARJ 12 and 13, outlined six radioactive boulders near an east-trending photogeological lineament. MARJ 1 and 2 lapsed in 1985.

DESCRIPTION

The regional geology is described by Laporte (1987). The grid area is extensively drift covered, with approximately 2% exposure of outcrop or subcrop. Underlying the grid is a heterogeneous assemblage of late Archean or early Proterozoic intrusions and gneissic or migmatized equivalents. Common intrusions are hornblende or leucocratic granite; aplite; quartz diorite to diorite; quartz monzonite, gabbro and undifferentiated intrusions. Units of red hematized breccia and a red aphanitic rock have been preferentially eroded yielding radioactive boulder clusters. Granitic to quartz monzonitic and granodioritic to quartz dioritic gneisses strike northeast to east and dip north at 36° to 80°. Joint sets with varying orientations are steeply dipping. A vertically to steeply dipping, polyclastic, mylonitized lineament trends east across the centre of MARJ 13. Two exposures of silicified andesite are northwest and south of the two claims and a gossan is on the shoreline of Marjorie Lake, near the southwest corner of MARJ 13.

CURRENT WORK AND RESULTS

Exploration in 1986 concentrated on the "Amethyst grid" and surrounding areas of MARJ 12 and 13. Geological mapping traced a train of radioactive boulders, coincident with an extrapolated photolineament. A total of 122 boulder and bedrock samples were collected. When compiled with previous results, an arithmetic mean of 0.693% U_3O_8 was calculated from assays of 251 boulders from the grid area.

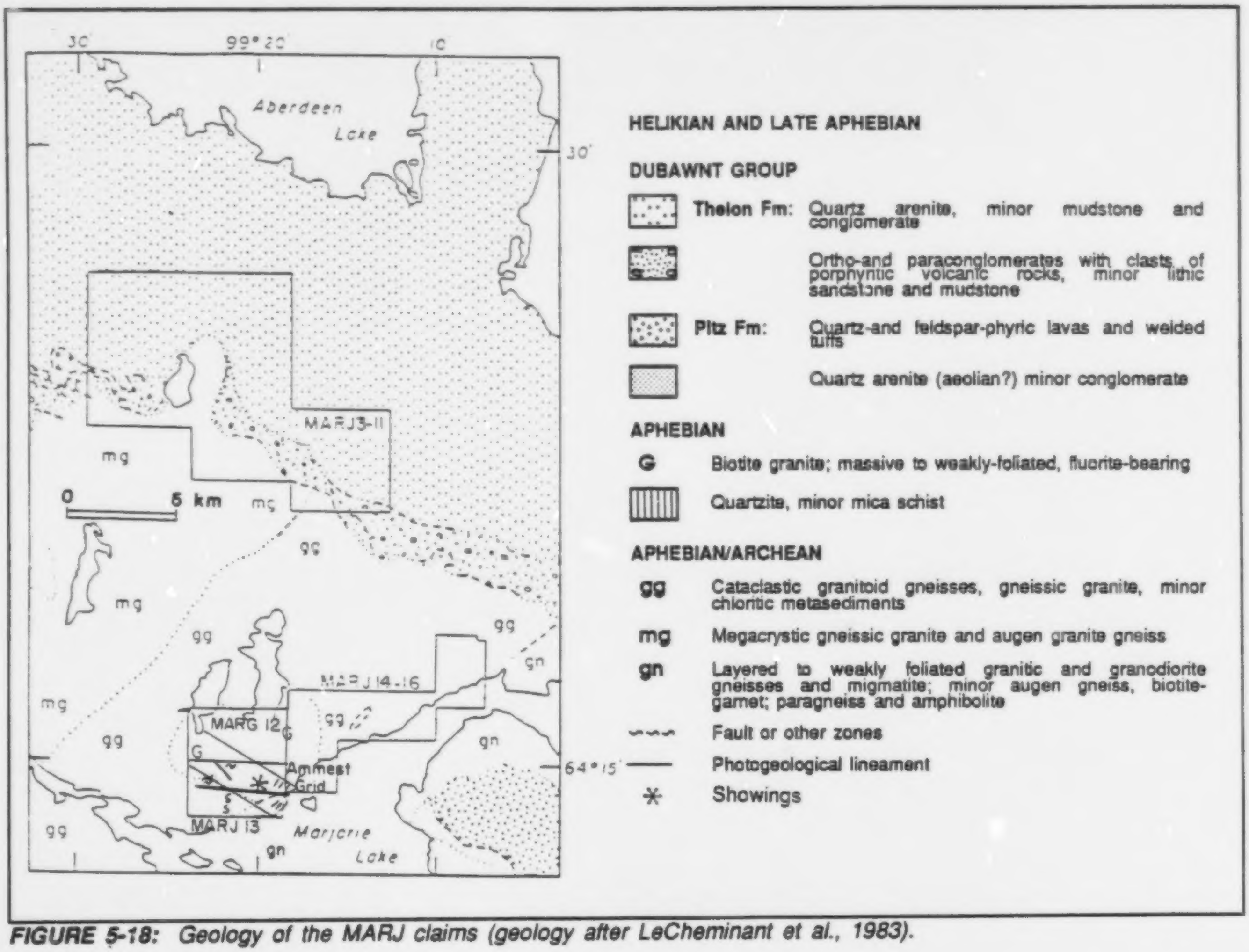

30'
99°20'
10'
30'
64°15'
Aberdeen Lake
MARJ3-11
MARJ 14-16
MARG 12
MARJ 13
Ammest Grid
Marjorie Lake
0 5 km
mg
gg
gn
G
HELIKIAN AND LATE APHEBIAN
DUBAWNT GROUP
Thelon Fm: Quartz arenite, minor mudstone and conglomerate
Ortho-and paraconglomerates with clasts of porphyritic volcanic rocks, minor lithic sandstone and mudstone
Pitz Fm: Quartz-and feldspar-phyric lavas and welded tuffs
Quartz arenite (aeolian?) minor conglomerate
APHEBIAN
G Biotite granite; massive to weakly-foliated, fluorite-bearing
Quartzite, minor mica schist
APHEBIAN/ARCHEAN
gg Cataclastic granitoid gneisses, gneissic granite, minor chloritic metasediments
mg Megacrystic gneissic granite and augen granite gneiss
gn Layered to weakly foliated granitic and granodiorite gneisses and migmatite; minor augen gneiss, biotite-garnet; paragneiss and amphibolite
Fault or other zones
Photogeological lineament
Showings

FIGURE 5-18: Geology of the MARJ claims (geology after LeCheminant et al., 1983).

Track Etch cup retrieval and soil sampling surveys were performed concurrently in selected areas of the grid. A number of weak soil anomalies were delineated. Track Etch cups were recovered after burial for 11 months, but gave questionable results. Radiometric block mapping, surficial geological mapping, magnetometer and VLF EM surveys were completed.

A total of 1002.84 m of diamond drilling in 12 holes tested showings and structural targets. No significant intersections were recovered.

CHANTREY INLET - WAGER BAY AREA

Laporte (1977) describes the geology of the Chantry Inlet-Wager Bay area as "a discontinuous belt of Archean volcanic and sedimentary rocks enclosing ultramafic flows and sills [which] trends northeast across the central part of the Chantrey Inlet-Wager Bay Area. The belt lies in a granitic basement complex consisting of north to east trending belts of felsic to mafic gneisses within gneissic or massive granitic intrusions of Archean and Aphebian age."

Heywood (1961) noted a number of komatiite outcrops, as well as sulphide- and oxide-facies iron formation within the region that has attracted sporadic interest in the nickel and gold potential of the area. Schau (1982) mapped a 3 by 3 m outcrop of soapstone which was used as carvingstone by local artists in Repulse Bay.

PERMIT 1090

Comaplex Resources Ltd.	Gold, Platinum
901 - 105 4th St. SW	56 K/3 NW
Calgary, Alta., T2R 1J4	66°10'N, 93°22.5'W

REFERENCES

Schau (1982).
DIAND assessment report: 082146.

PROPERTY

Prospecting Permit 1090 (56 K/3 NW Quadrant).

LOCATION

The permit is approximately 250 km northeast of the Hamlet of Baker Lake (Fig. 5-1).

HISTORY

Aquitaine Company of Canada Ltd. worked in the vicinity northeast of Prospecting Permit 1090 during base metals exploration, from 1970 to 1972. The company staked the ENG claim group on the eastern boundary of Prospecting Permit 1090. An EM and magnetic survey was flown over the Aquitaine permits and claims, but few conductors were detected and follow-up ground geophysics, mapping and prospecting failed to delineate any zones of economic interest.

DESCRIPTION

The permit is underlain by meta-komatiites, metasediments, quartzites, phyllites, chlorite schists, iron formation and conglomerates of the Archean Prince Albert Group. Metamorphic grade is upper greenschist facies with kyanite. A small granitic stock intrudes in the northeast of the permit area and a granite pluton underlies the western portion of the permit area. Spinifex textures in komatiites have been recorded in the east central area of the permit and an arsenopyrite showing was mapped at the eastern contact of the northeast granitic stock (Schau, 1982).

Foliation in the permit area strikes from north-northeast to east-northeast and dips sub-vertically. A late phase of folding and faulting with northwesterly trends is indicated by small drag folds, kinking in ultramafic flows, northeasterly trending protuberances in the granite contact and the orientation of diabase dykes and local arsenopyrite veins (DIAND assessment report 082146).

CURRENT WORK AND RESULTS

Reconnaissance geological mapping and prospecting surveys were conducted on the permit area during 1986. The surveys delineated beds of oxide-facies iron formation, 60 to 120 m thick, in the central and eastern portions of the property. Two samples from shear zones at metapelite-ultramafic flow contacts in the southwest and central portions of the permit yielded 1.2 and 0.9 ppm Au respectively. The second sample also contained 0.51% Ni. A sample from a sheared metapelite, hosting a quartz vein system and pyritic gossan, assayed 10.85 ppm Ag and 0.54% Cu.

Arsenopyrite forms disseminations, veins less than 1 cm wide and fracture fillings at the eastern contact of the northeastern granitic stock.

Samples of ultramafic flows were assayed for nickel, chromium, platinum and palladium.

QUILIK, M1 AND M2 CLAIMS

Megagem
Box 1406
Yellowknife, NWT, X1A 2P1

Carvingstone, Precious Metals, Base Metals
56 M/6,11,12
67°40'N, 95°30'W

REFERENCES

Heywood (1961); Frisch *et al.* (1985); Cerny (1989).
DIAND assessment report: 082635.

PROPERTY

QUILIK 1 (F12225).
M1-M2 (F12226-F12227).

LOCATION

The claims are on the east shore of Chantry Inlet. M1 and M2 are south of Cape Barclay and the QUILIK 1 claim is off shore on an island northwest of the Victoria Headland (Fig. 5-1).

HISTORY

Carvingstone deposits on the claims were discovered in 1978 by Simon Higiniq, who had been quarrying soapstone in the area. QUILIK and M1 were staked in August of 1985 by Alex Beaulieu and Simon Higiniq. M2 was staked in 1986 at which time the claims were transferred to Megagem Ltd.

DESCRIPTION

The QUILIK 1 claim is underlain by the Chantrey belt. The Barclay belt (Cerny, 1989), a parallel belt of metamorphosed supracrustal rocks, cross-cuts the M claims. Heywood (1961) suggested that the belt may represent a northern extension of the Hurwitz Group. Frisch (1985) suggested that deposition of these rocks was coeval with the deposition of Chantry Group rocks (Fig. 5-19).

The Chantrey Group rocks are amphibolite-grade metasediments, including carbonate and quartzitic rocks, overlain by fine-grained pelites/psammites, quartzite, metaconglomerate and pyrite schist. A persistent carbonate unit comprises calcitic or dolomitic marble with siliceous interbeds and variegated calcsilicate layers (Frisch, 1985). Chiastolite porphyroblasts up to 25.0 cm (average 2.0 to 3.0 cm) long, as well as garnet and biotite, are developed in pelitic schist (Frisch, 1985). The supracrustals are intruded by pegamatites and quartz veins. Overgrowths of euhedral quartz crystals with rare fibrous aggregates of hematite are found within quartz vein cavities (Cerny, 1989). The Chantry Group rocks are tightly folded to form a doubly plunging, northeast-trending syncline, 5 km wide and 175 km long, in apparent unconformable contact with basement rocks.

Metavolcanics, metapelites, chlorite schists, silicate-facies iron formation and subordinate quartz-eye schist, amphibolite, oxide-facies iron formation, marble, quartzite and metaconglomerate comprise the rocks of the Barclay belt. Andalusite, cordierite and staurolite porphyroblasts are found within the metapelites. The belt trends in a northeasterly direction for 60 km and has a maximum width of 5 km (Cerny, 1989).

The supracrustal rocks are intruded by leucogranite bodies and pegmatites. Beryl and garnet are accessory minerals in the pegmatites. Quartz veins carry tourmaline along contacts and euhedral quartz crystals within vugs (Cerny, 1989).

CURRENT WORK AND RESULTS

Work on the property during 1986 and 1987 consisted of mapping, trenching and sampling "unusual" pyritic rocks, coloured prismatic stones and crystals. Samples were analyzed for gold, silver, copper, zinc, arsenic, beryllium and tantalum, although the emphasis was on finding carvingstone and gemstone materials. A total of 80 samples were collected. One sample of garnet gneiss, adjacent to amphibolite on M1, assayed 4.1 ppm Au, 7.5 ppm Ag and 20.8% Zn.

A business proposal was developed late in 1987 to establish an arts and crafts industry supplying marble for carvingstone use and collecting mineral specimens such as garnet and quartz crystals.

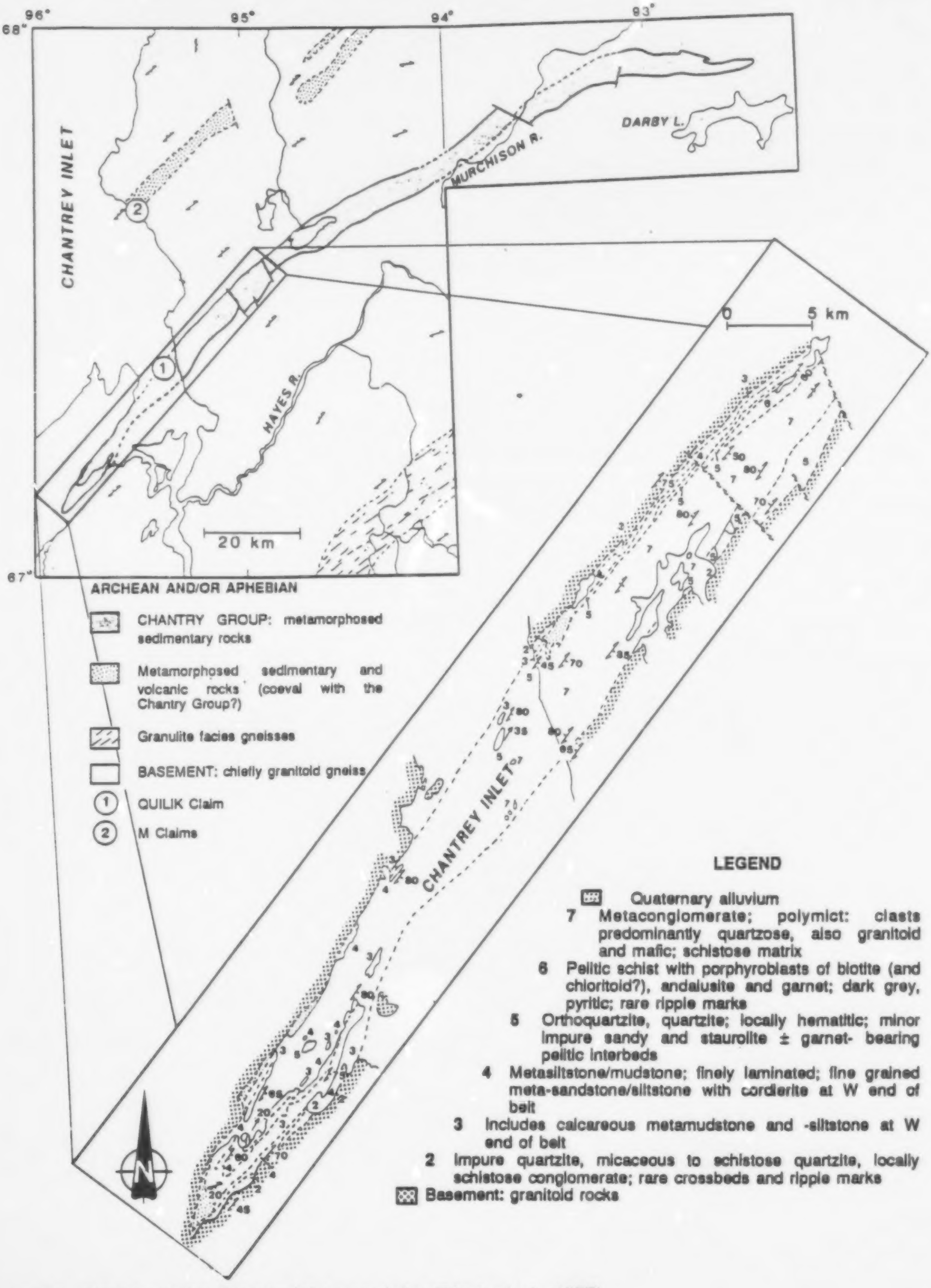

96°
95°
94°
93°
68°
67°
CHANTREY INLET
DARBY L.
MURCHISON R.
HAYES R.
20 km
0
5 km
CHANTREY INLET
ARCHEAN AND/OR APHEBIAN
CHANTRY GROUP: metamorphosed sedimentary rocks
Metamorphosed sedimentary and volcanic rocks (coeval with the Chantry Group?)
Granulite facies gneisses
BASEMENT: chiefly granitoid gneiss
① QUILIK Claim
② M Claims
LEGEND
Quaternary alluvium
7 Metaconglomerate; polymict: clasts predominantly quartzose, also granitoid and mafic; schistose matrix
6 Pelitic schist with porphyroblasts of biotite (and chloritoid?), andalusite and garnet; dark grey, pyritic; rare ripple marks
5 Orthoquartzite, quartzite; locally hematitic; minor impure sandy and staurolite ± garnet- bearing pelitic interbeds
4 Metasiltstone/mudstone; finely laminated; fine grained meta-sandstone/siltstone with cordierite at W end of belt
3 Includes calcareous metamudstone and -siltstone at W end of belt
2 Impure quartzite, micaceous to schistose quartzite, locally schistose conglomerate; rare crossbeds and ripple marks
Basement: granitoid rocks
N

FIGURE 5-19: Geology of the Chantry Inlet area (after Frisch et al., 1985).

REFERENCES

Ashton, K.E., 1982:
Further geological studies of the "Woodburn Lake Group" northwest of Tehek Lake, District of Keewatin; *in* Current Research, Part A, GSC Paper 82-1A, p. 151-157.

Bell, R.T., 1971:
Geology of Henik Lakes (East Half) And Ferguson Lake (East Half) Map-Areas, District of Keewatin; Geological Survey of Canada, Paper 70-61, 31 p.

Caine, T.W., and Brown, D.D., 1987:
Mines and Important Mineral Deposits of the Yukon and Northwest Territories, 1986; Mining Resources Section, DIAND, 47 p.

Cadiz, E., 1989:
Summary of 1986 and 1987 Exploration Program on the Susan Claims; Borealis personal correspondence.

Cerny, P., Wise, M.A., Tomascak, P., 1989:
Reconnaissance of M1, M2 and Quilik 1 Claims, Chantrey Inlet, N.W.T., NWT Geology Division, DIAND, Yellowknife, EGS 1989-3, 16 p.

Charbonneau, B.W. & Swettenham, S.S., 1986:
Gold occurrence in radioactive calc-silicate float at Sandybeach Lake, Nueltin Lake area, District of Keewatin, *in* Geological Survey of Canada, Paper 86-1A.

Davidson, A., 1970:
Precambrian Geology, Kaminak Lake Map Area, District of Keewatin; Geological Survey of Canada, Paper 69-51.

Davidson, A., 1972:
The Churchill Province *in* Variations *in* Tectonic Styles in Canada, eds. R.A. Price and P.J.W. Douglas; Geological Association of Canada, 25th Anniversary Volume, Special Paper No. 11.

Eade, K.E., 1973:
Geology of Nueltin Lake and Edehon Lake (west half) map areas, District of Keewatin; Geological Survey of Canada, Paper 72-21, 29 p.

Eade, K.E., 1974:
Geology of the Kognak River Area, District of Keewatin, Northwest Territories; Geological Survey of Canada, Memoir 377, 66 p.

Eade, K.E., 1986:
Precambrian Geology of the Tulemalu Lake-Yathkyed Lake Area, District of Keewatin; Geological Survey of Canada, Paper 84-11, 31 p.

Frisch, T., Annesley, I.R., Gittins, C.A., 1985:
Geology of the Chantrey Belt and its Environs, Lower Hayes River and Darby Lake Map Area, Northern District of Keewatin; *in* Current Research, Part A, Geological Survey of Canada Paper 85-1A, p. 259-266.

Goodwin, A.M., Ridler, R.H., 1970:
The Abitibi Orogenic Belt, *in* Symposium on Basins and Geosynclines of the Canadian Shield, Geological Survey of Canada Paper 70-40, p. 1-30.

Goodwin, A.M., 1973:
Archean Iron-Formations and Tectonic Basins of the Canadian Shield, *in* Economic Geology, vol 68, no 7.

GSC, 1976:
National Geochemical Reconnaissance Maps, Geological Survey of Canada, open file 417.

Heywood, W.W., 1961:
Geological Notes, Northern District of Keewatin, Geological Survey of Canada Paper 61-18, 9 p.

Heywood, W.W., 1973:
Geology of Tavani map-area, District of Keewatin; Geological Survey of Canada, Paper 72-47, 14 p.

Laporte, P.J., 1974a
Mineral Industry Report, 1969 and 1970, volume 2, Northwest Territories east of 104° West longitude; NWT Geology Division, DIAND, Yellowknife, EGS 1974-1, 191 p.

Laporte, P.J., 1974b
Mineral Industry Report, 1971 and 1972, volume 2, Northwest Territories east of 104° West longitude; NWT Geology Division, DIAND, Yellowknife, EGS 1974-2, 88 p.

Laporte, P.J. 1976:
Keewatin Region; *in* Mineral Industry Report 1973, NWT Geology Division, DIAND, Yellowknife, EGS 1976-9, District and Melville Peninsula, p. 10-33.

Laporte, P.J. 1983a:
Keewatin Region; *in* Mineral Industry Report 1976, NWT Geology Division, DIAND, Yellowknife, EGS 1983-2, p. 34-59.

Laporte, P.J. 1983b:
Keewatin Region *in* Mineral Industry Report 1979, NWT Geology Division, DIAND, Yellowknife, EGS 1983-9, p. 69-127.

Laporte, P.J. 1984:
Keewatin Region; *in* Mineral Industry Report 1980-81, NWT Geology Division, DIAND, Yellowknife, EGS 1984-5, p. 131-199.

Laporte, P.J. 1985:
Keewatin Region; *in* Mineral Industry Report 1982-83, NWT Geology Division, DIAND, Yellowknife, EGS 1985-4, p. 157-201.

Laporte, P.J. 1985b:
The Gold Potential of the Ketyet River and Woodburn Lake Groups, Tehek Lake Area, NWT, NWT Geology Division, DIAND, Yellowknife, EGS 1985-11, 23 p.

Laporte, P.J. 1987:
Keewatin Region; *in* Mineral Industry Report 1984-85, NWT Geology Division, DIAND, Yellowknife, p. 93-123.

LeCheminant, A.N., Ashton, K.E., Chiarenzelli, J., Donaldson, J.A., Best, M.A., Tella, S. and Thompson, D.L., 1983:
Geology of the Aberdeen Lake map-area, District of Keewatin: preliminary report; *in* Current Research, Part A, Geological Survey of Canada, Paper 83-1A, p. 437-448.

Padgham, W.A., 1985
Fat Lake property visit report.

Reinhardt, E.W., Chandler, F.W., and Skippen, G.B., 1980:
Geology of Macquoid Lake and Gibson Lake areas; Geological Survey Canada, Open File 703.

Ridler, R.H., Shilts, W.W., 1974:
Exploration For Archean Polymetallic Sulphide Deposits in Permafrost Terrains: An Integrated Geological/Geochemical Technique; Kaminak Lake Area, District of Keewatin; Geological Survey of Canada, Paper 73-34, 33 p.

Schau, M, 1982:
Geology of the Prince Albert Group in Parts of Walker Lake and Laughland Lake Map Areas, District of Keewatin: Geological Survey of Canada, Bulletin 337, 62 p.

Shilts, W.W., 1973:
Drift Prospecting; Geochemistry of Eskers and Till in Permanent Frozen Terrain, District of Keewatin, N.W.T.; Geological Survey of Canada, Paper 72-45, 34 p.

Tella, S. *et al.*, 1986:
Geology of Parts of Tavani, Marble Island, and Chesterfield Inlet Map Areas, District of Keewatin: A Progress Report; Geological Survey of Canada Paper 86-13, 20 p.

Thorpe, R.I., 1972:
Mineral exploration and mining activities, mainland N.W.T., 1966-1968 (excluding Coppermine River area); Geological Survey of Canada, Paper 70-70, 204 p.

Urangesellschaft, 1989:
Part 1, Project Description, *in* The Kiggavik Project Environmental Assessment Report.

Wright, G.M., 1967:
Geology of the Southeastern Barren Grounds, Parts of the Districts of Mackenzie and Keewatin; Geological Survey of Canada, Memoir 350, 91 p.

CHAPTER 6
SOUTHEAST MACKENZIE DISTRICT

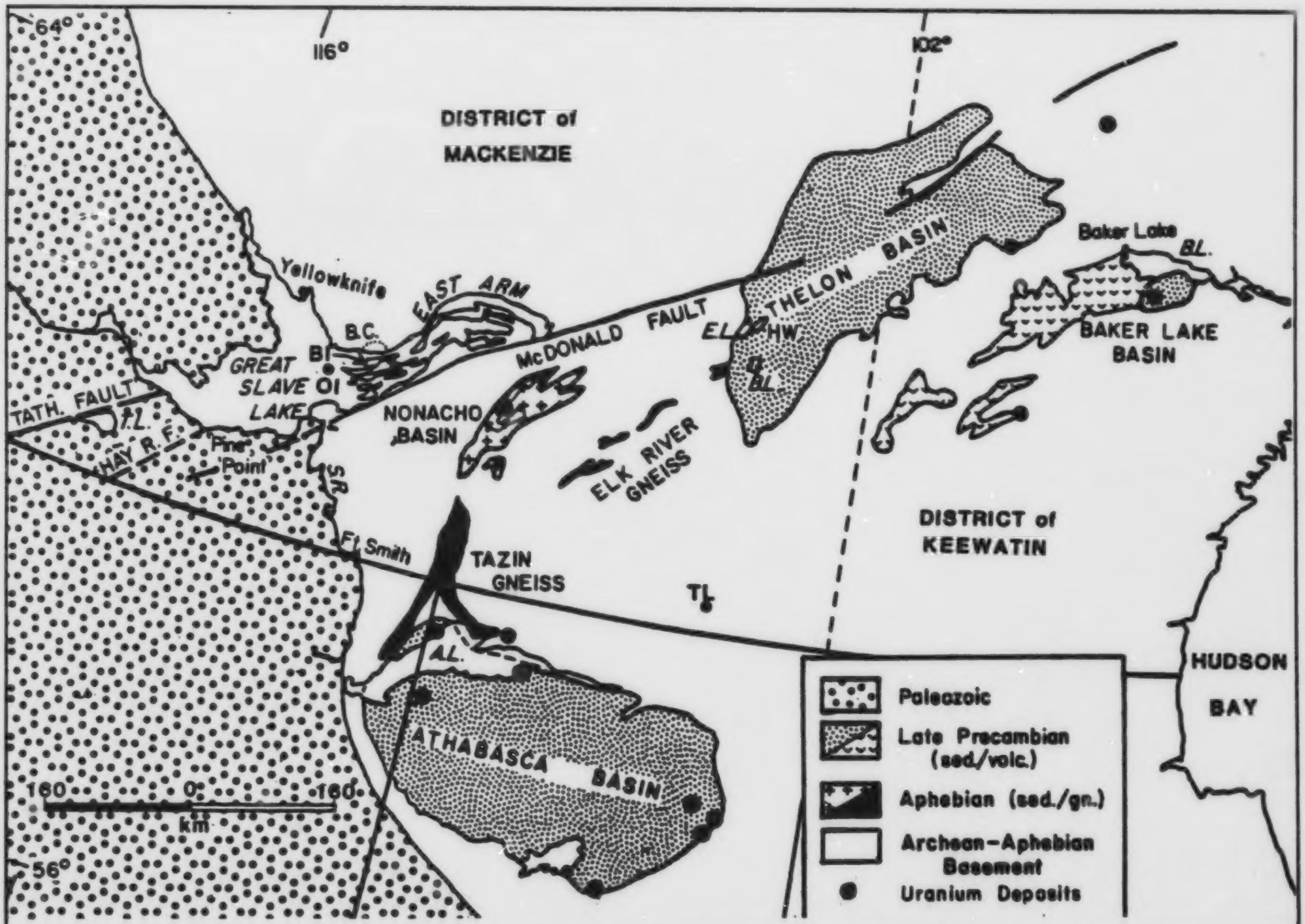
Walter A. Gibbins
District Geologist

INTRODUCTION

The southeastern District of Mackenzie includes Paleozoic carbonates of the Great Slave Plain, where lead-zinc is the main exploration target, and part of the Churchill Province of the Precambrian Shield (Fig. 6-1). This part of the Shield has recently been subdivided into the 1.8 to 2.0 Ga Taltson Magmatic Zone in the west (Fig. 6-2) and the pre-2.5 Ga Rae terrane on the east (Hoffman 1987, 1988a; Bostock *et al.*, 1987). From 1980 to 1985, uranium was actively sought in the western Thelon Basin, Nonacho Basin and east arm of Great Slave Lake (Gibbins 1984, 1985, 1987). However, by 1986 uranium exploration had ceased. Similarly lead-zinc exploration and mining in Devonian carbonates of the Pine Point District came to an end in early 1987.

In contrast there was an increase in base- and precious-metal exploration and a continued strong exploration effort and feasibility studies at Highwood Resources Ltd.'s niobium-tantalum and gallium-beryllium-yttrium-zirconium-rare earth deposits in the Blatchford Lake Complex. In September 1986, Highwood Resources Ltd. entered into an agreement with Hecla Mining Company of Canada Ltd. to assess and possibly bring the Thor Lake deposits into production.

Other exploration included a Dighem electromagnetic survey of the Outpost Islands by Rapparee Resources Ltd. in September 1987. The Outpost Islands (OI in Fig. 6-1) are the site of a former gold-tungsten-copper mine, the Fox Mine, that operated in the 1940's (Lord 1951, p. 236-240).


64°
116°
102°
DISTRICT of MACKENZIE
Yellowknife
EAST ARM
B.C.
BI
GREAT SLAVE LAKE
OI
TATH. FAULT
T.L.
HAY R. F.
Pine Point
SR
McDONALD FAULT
NONACHO BASIN
ELK RIVER GNEISS
THELON BASIN
EL
HW
BL
Baker Lake
BL.
BAKER LAKE BASIN
DISTRICT of KEEWATIN
Ft Smith
TAZIN GNEISS
TL
AL.
ATHABASCA BASIN
160
0
160
km
56°
HUDSON BAY
Paleozoic
Late Precambian (sed./volc.)
Aphebian (sed./gn.)
Archean–Aphebian Basement
Uranium Deposits

AL - Lake Athabaska	BI - Blanchet Island	*EL* - Eyeberry Lake	OI - Outpost Islands	*TL* - Thye Lake
BC - Blatchford Lake Complex	*BL* - Beaverhill Lake	HW - Hurwitz quartzite	*SR* - Slave River	

FIGURE 6-1: Map of the southeast Mackenzie District, Dubawnt and Athabaska Basins.

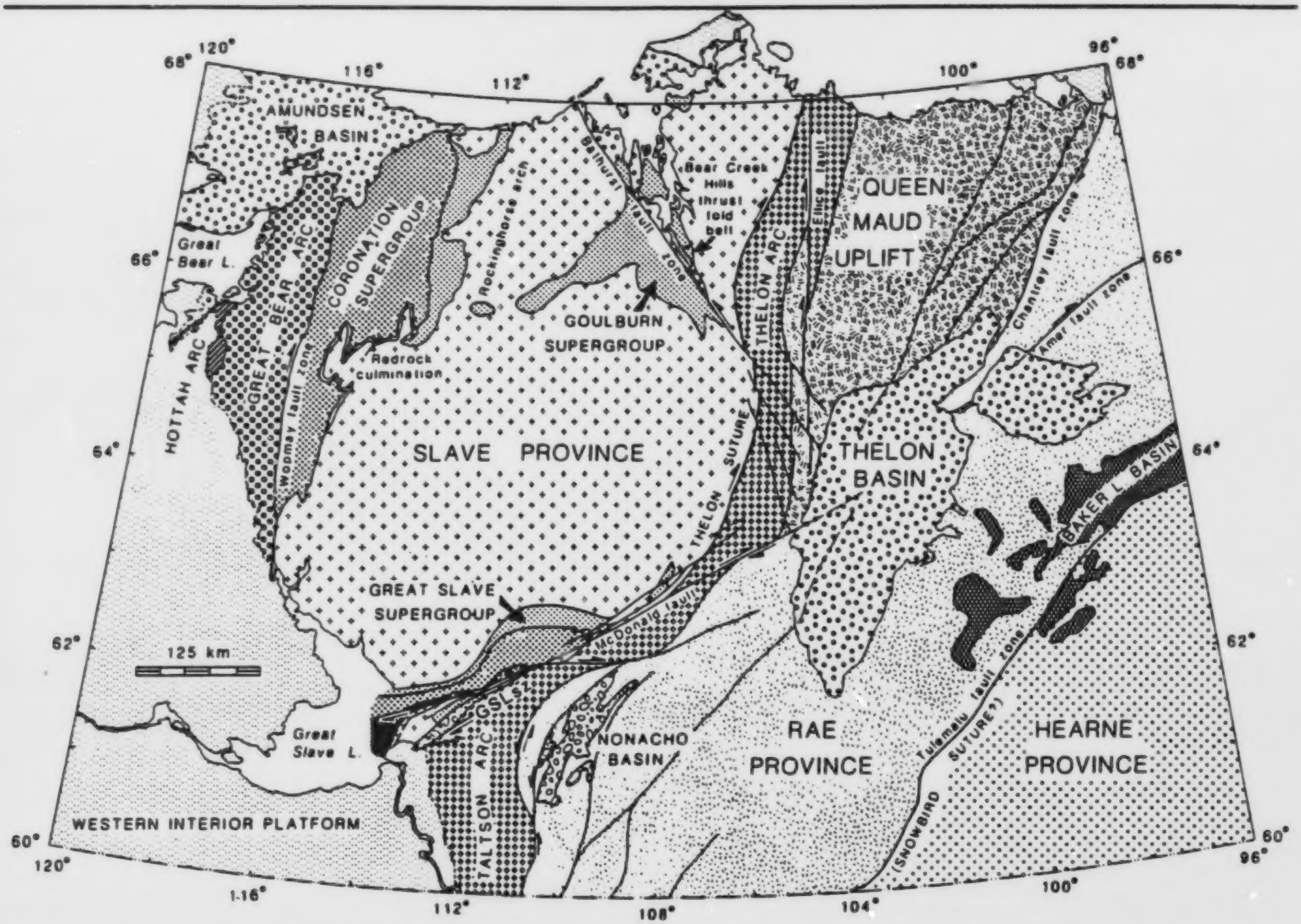

120°
116°
112°
100°
96°
68°
66°
64°
62°
60°
108°
104°
AMUNDSEN BASIN
Great Bear L.
HOTTAH ARC
GREAT BEAR ARC
Wopmay fault zone
CORONATION SUPERGROUP
Redrock culmination
Rockinghorse arch
Bathurst fault zone
Bear Creek Hills thrust fold belt
GOULBURN SUPERGROUP
THELON ARC
Ellice fault
QUEEN MAUD UPLIFT
Chantrey fault zone
Amer fault zone
SLAVE PROVINCE
THELON SUTURE
THELON BASIN
BAKER L. BASIN
GREAT SLAVE SUPERGROUP
McDonald fault
125 km
GSLsz
TALTSON ARC
NONACHO BASIN
RAE PROVINCE
Tulemalu fault zone
(SNOWBIRD SUTURE?)
HEARNE PROVINCE
Great Slave L.
WESTERN INTERIOR PLATFORM

FIGURE 6-2: The northwest Canadian Shield showing tectonic elements (from Hoffman, 1988a).

Ultramafic rocks in the Snowbird Lake map sheet, NTS 75 A (Taylor, 1963) became the target for platinum group element exploration. Several claims were staked in the Thye (Thoa) Lake-Opescal Lake area (TL in Fig. 6-1).

EAST ARM OF GREAT SLAVE LAKE

Hoffman *et al.* (1974, 1977) named the east arm area the "Athapuscow Aulacogen". It is a deformed east-northeast-trending basin, 270 km long by at most 80 km wide, containing little metamorphosed early Proterozoic sedimentary and magmatic rocks exposed in and around the east arm of Great Slave Lake. Hoffman (1977, 1988b) subdivided the Late Aphebian Great Slave Supergroup into the Union Island, Sosan, Kahochella, Pethei and Christie Bay Groups. They are unconformably overlain by the Helikian Et-Then Group and underlain by the Early Aphebian Union Island Group.

The east arm of Great Slave Lake area has been prospected and explored during the past 40 years, resulting in the discovery of numerous copper, uranium, nickel-cobalt, gold and silver showings. However, economically viable deposits have not been discovered to date. Mineral rights for much of the east arm were withdrawn under Order in Council P.C. 1970-526.

CARMEN 1 CLAIM

Highwood Resources Ltd.	Cobalt, Nickel
12th Floor, 20 Toronto St.	85 H/15
Toronto, Ont., M5C 2B8	61°57'N, 112°45'W

REFERENCES

Badham (1978); Badham and Muda (1980); Hoffman (1977, 1981, 1987, 1988b); Hoffman *et al.* (1977).
DIAND assessment report: 082592.

PROPERTY

CARMEN 1.

LOCATION

The CARMEN 1 claim is at the southwest end of Blanchet Island. Blanchet Island is an uninhabited, sparsely forested, east-northeast-trending island, 45 km long and 3 to 12 km wide, south of the Hearne Channel, in the east arm of Great Slave Lake (BI in Fig. 6-1).

Access is by aircraft, boat in summer or tracked vehicle in winter and early spring. Blanchet Island is 100 km east-southeast of Yellowknife and 215 km northeast of Hay River.

HISTORY

The CARMEN 1 and nearby HRL claims (see next report) were staked in December 1984. There are no records of work or assessment reports for the CARMEN 1 area. However, there are a number of small excavations that were probably made at the time of cobalt-nickel mining on Blanchet Island in 1969-70.

DESCRIPTION

The geology of the east arm of Great Slave Lake has been mapped (Hoffman, 1977, 1988b) and discussed by Hoffman (1981, 1987) and Hoffman *et al.* (1977). A line of 1.87-1.86 Ga calc-alkaline intrusions, known as the Caribou Laccoliths (Hoffman, 1977, 1981, 1988b) may be causally related to subduction of a re-entrant of oceanic lithosphere south of the Slave Province (Hoffman, 1987). At the margins of some of these intrusives cobalt-nickel arsenide veins, occasionally silver bearing, are locally developed (Badham, 1978; Badham and Muda, 1980).

CARMEN 1 includes mainly Caribou Laccolith diorite, with underlying Stark Formation argillite. The diorite is oxidized 5 to 50 m above its lower contact, causing red weathering.

CURRENT WORK AND RESULTS

In September 1987, a two-person crew mapped and prospected the diorite contact and sampled favourable-looking rocks and structures. Minor mineralization products were noted at three places. Two are on a west-facing cliff near the centre of the claim. The most interesting of these is a film of nickel-cobalt arsenide, as well as malachite and erythrite stains, on joints and fractures in the diorite within 2 m of the contact with underlying Stark Formation argillite. A chip sample over 50 cm assayed 0.3% Co.

A second prospect is a malachite stain and a 1 by 10 cm patch of chalcopyrite near the red-grey diorite transition. Both of these have evidence of earlier trenching or pitting.

The third, near the southwest corner of the claim, contains weak malachite staining and a few specks of chalcopyrite in quartz veins.

No significant cobalt-nickel minerals or alteration were found. Exploration of the contact below the diorite would require geophysical methods.

HRL 1, 2 CLAIM

Highwood Resources Ltd.	Cobalt, Nickel
12th Floor, 20 Toronto St.	85 H/16, I/1
Toronto, Ont., M5C 2B8	61°59'N, 112°23'W

REFERENCES

Badham (1978); Badham and Muda (1980); Hoffman (1977, 1981, 1987, 1988b); Hoffman *et al.* (1977); Mason (1969); Murphy (1971); Padgham *et al.* (1978).

DIAND assessment report: 082591 (other assessment reports: 060836 and 060088).

PROPERTY

HRL 1 and 2.

LOCATION

Blanchet Island is a 10 by 45 km island at the western end of the east arm of Great Slave Lake (Bl in Fig. 6-1). It is separated from the mainland by the Hearne Channel. The HRL claims are along the southeast shore of Blanchet Island, near the point midway along the island where the width of the island decreases suddenly (Fig. 6-3a).

The claims are 115 km east-southeast of Yellowknife and 220 km northeast of Hay River.

HISTORY

In 1968 F. Giauque of Yellowknife discovered the principal cobalt-nickel showing on Blanchet Island, after observing cobalt stain from an aircraft. He staked the 4 LUX claims (now the

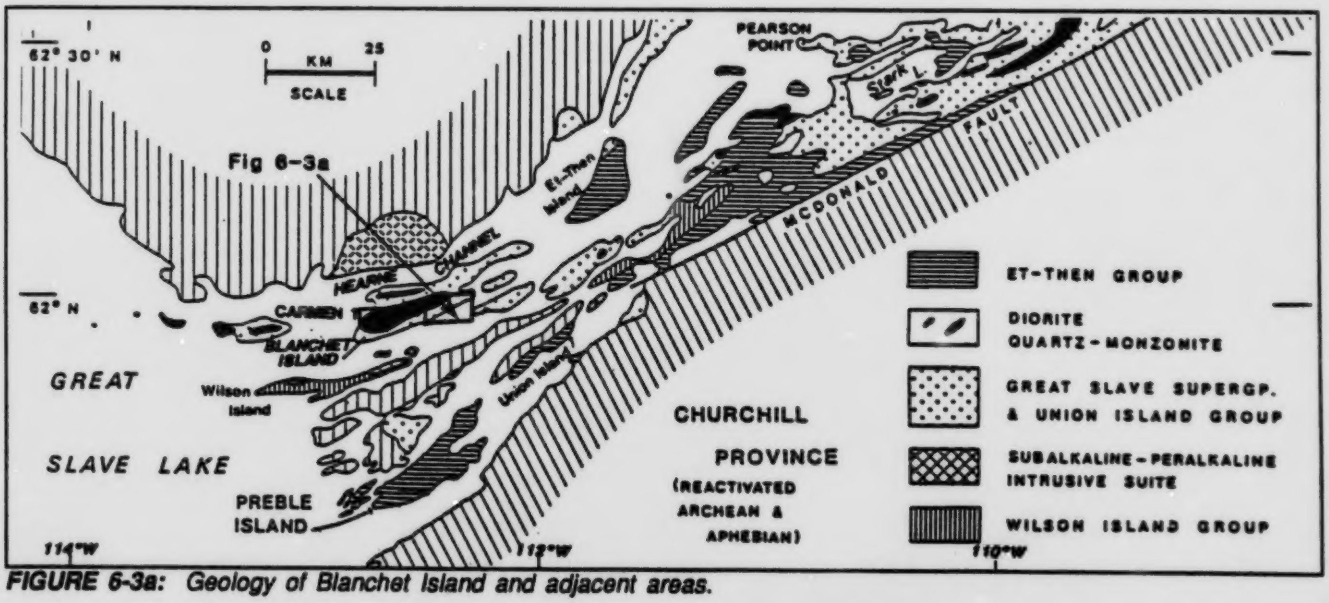

62° 30' N
0
KM
25
SCALE
PEARSON POINT
Stark L.
MCDONALD FAULT
Et-Then Island
Fig 6-3a
HEARNE CHANNEL
62° N
CARMEN 1
BLANCHET ISLAND
GREAT
SLAVE LAKE
Wilson Island
Union Island
PREBLE ISLAND
CHURCHILL
PROVINCE
(REACTIVATED ARCHEAN & APHEBIAN)
114°W
112°W
110°W
ET-THEN GROUP
DIORITE QUARTZ-MONZONITE
GREAT SLAVE SUPERGP. & UNION ISLAND GROUP
SUBALKALINE-PERALKALINE INTRUSIVE SUITE
WILSON ISLAND GROUP

FIGURE 6-3a: Geology of Blanchet Island and adjacent areas.

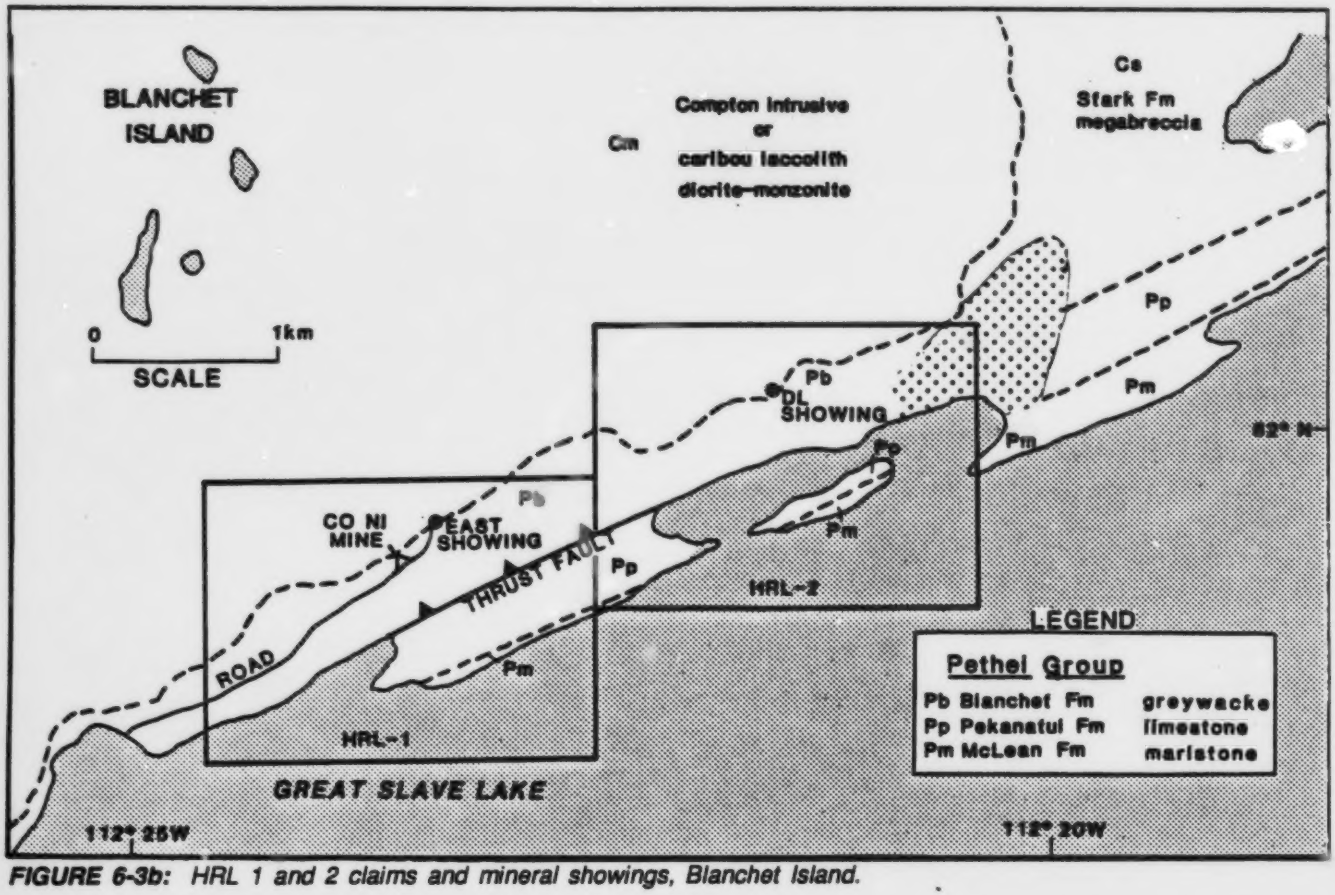


FIGURE 6-3b: HRL 1 and 2 claims and mineral showings, Blanchet Island.

HRL 1 claim, Fig. 6-3b) and optioned them to Jason Explorers Ltd. of Vancouver. Jason Explorers staked the DEE claims (1-17) to the north and west of the LUX group in 1969. The DL claims (now HRL 2) were staked in 1969 by D. Lent to cover similar mineral showings east of the DEE claims. Four XLR and five LK claims were staked along the intrusive contact southwest of the DEE group.

In 1969-70 massive nickel-cobalt arsenide ore, mainly niccolite and cobaltite, at the main showing was mined by Jason Explorers from an open cut about 10 m wide, by 7 m high and 6 m deep, and an adit 25 m long, by 2 m high and 1.5 m wide. A trench was cut 8 m east of the adit 6 m long, by 2 m wide and 2.5 m deep. Initially, selected material from the open cut was bagged for shipment, but in later mining from the adit, a rail cart was used to haul high-grade ore from the adit. It was then dropped down a 25 cm by 20 m long steel tube into 45 gal drums. A short road connects the mine to the camp and loading dock, 1500 m to the southwest (Fig. 6-3b). Apparently some 130 t of high-grade Ni-Co arsenide ore (25% Ni + Co) was mined, and of this 90 t was shipped to Ugine Kuhlmann SA of France. Murphy (1971) reported that there were 40 barrels (each about 1 t) at the loading dock, but according to D. Smith (1988, personal communication) only 10 barrels of badly weathered arsenides remain.

In 1969 Jason Explorers drilled 15 diamond drillholes (E core) on the LUX group ranging from 5.4 to 19.5 m deep and totalling 191.1 m (DIAND assessment report 060088). These were collared in the area immediately above the open cut, mostly in diorite, and were intended to explore the intrusive/sedimentary contact. Cobalt-nickel minerals were intersected in 7 holes, apparent thicknesses ranged from 0.1 m to 5.9 m but no assays were done. In 1970 a magnetometer survey was carried out on the DL claims and 11 holes (E core) totalling 190.5 m were drilled in the vicinity of a cobalt-nickel showing (DIAND assessment report 060836). Four holes drilled through the diorite intersected a thin high-grade cobalt-nickel arsenide vein in a cut 6 m long by 2 m by 2 m.

The HRL claims, comprising 500 ha, were staked in December, 1984.

DESCRIPTION

The geology of the east arm of Great Slave Lake has been mapped and discussed by Hoffman (1977, 1981, 1987, 1988b) and Hoffman *et al.* (1977). The core of Blanchet Island, including the HRL claims, is underlain by a large 2.5 km long diorite-monzonite intrusion, which is one of the Compton intrusive suite (Hoffman, 1988b) or Caribou Laccoliths (Hoffman, 1977). A line of these intrusions follows the axis of the east arm (Hoffman, 1988b) and may be causally related to subduction of a re-entrant of oceanic lithosphere south of the Slave Province (Hoffman, 1987). At the margins of these intrusives, cobalt, nickel and copper arsenide minerals, some silver bearing, have been discovered (Badham, 1978, Badham and Muda, 1980), including several showings on Blanchet Island.

Figure 6-3b shows the geology in the vicinity of the HRL claims. Aphebian sediments of the Pethei Group, Great Slave Supergroup, dip northwestward at 25 to 40 degrees under diorite of a Caribou Laccolith. A prominent escarpment up to 90 m above the lake level trends northeasterly across the claims. The diorite-sediment contact undulates across this escarpment with a wavelength of about 100 m and an amplitude of 30 m. Three showings of cobalt-nickel minerals have been found in the sediments immediately below this contact (Fig. 6-3).

All showings seem to be confined to an area within 5 m of the diorite-sediment contact. Each showing is hosted by a thin dolomite unit which has been veined and brecciated more or less parallel to the contact. The mineralization, principally grey cobalt-nickel arsenides and lesser niccolite, forms pods, veins, matrix fillings and replacements of this unit. Close to the contact magnetite seems to replace carbonate and actinolite in more siliceous beds, leading to the view that the deposits are developed in skarn zones. The cobalt-nickel minerals appear related to antiformal parts of contact undulations, previously described as crenulations or cusps.

Small-scale mining operations (a 20 by 5 by 5 m open cut, and a 25 m adit) have removed much of the high-grade cobalt-nickel mineralization, leaving only scattered remnants. According to James Kelly, who visited the deposit during mining, the vein was 10-12 m long and 15.2 cm to 2 m wide with an ore shoot 3-5 m long averaging 1.3 m wide. This vein had essentially massive cobalt-nickel arsenide. Kelly noted the presence of safflorite, rammelsbergite, niccolite and secondary uranium minerals. Murphy (1971) noted secondary annabergite and Badham (1978) identified skutterudite, cobaltite, silver and bismuth. Badham and Muda (1980) noted loellingite and bismuthinite. Mason (1969) stated that representative assays of the 1.3 m wide ore zone were in the range 15% Ni, 10% Co with 5% Bi and 60% As. It was reported that no PGE or gold was present.

CURRENT WORK AND RESULTS

In September 1987 a two-person crew briefly examined known showings and prospected the diorite-sediment contact for larger zones of cobalt-nickel mineralization. They also collected samples of radioactive arsenide minerals to test for hydrothermal U-Au-PGE concentrations similar to Coronation Hill or Nicholson Bay. Despite improved analytical methods, the gold and PGE contents remain at or below detection levels. Low silver and bismuth assays failed to confirm those of previous reports.

BLATCHFORD LAKE PLUTONIC COMPLEX

The Blatchford Lake intrusive suite includes all the plutonic rocks of alkaline affinity that form a coherent complex known as the Blatchford Lake Plutonic Complex. It intrudes Archean plutonic rocks and metasediments of the Yellowknife Supergroup (Fig. 6-4) at the southern margin of the Slave Province and is bounded by Blatchford Lake on the north and Hearne Channel of Great Slave Lake on the south (Davidson, 1978). Geological mapping by Davidson (1972, 1978) led to the recognition of several units that make up this multiphase, sub-circular ring complex some 23 km in diameter and 235 km² in area.

The suite shows a remarkable range in composition that developed as the rocks crystallized during a sequence of intrusive events documented by field relationships (Davidson, 1972, 1978). Successive units range from gabbro, with anorthosite inclusions, through leuco-ferrodiorite, quartz syenite and granite, to peralkaline granite and syenite (Davidson, 1982).

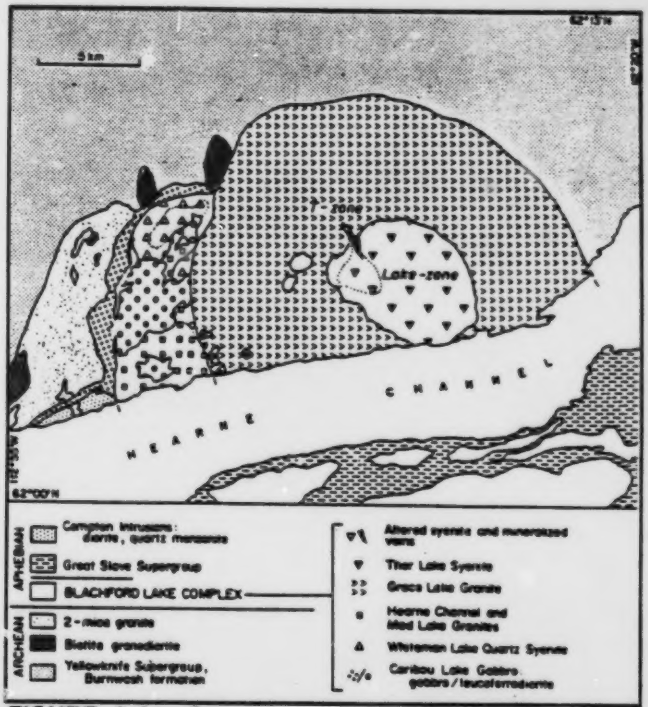

62°15'N
5 km
T-zone
Lake-zone
H E A R N E
C H A N N E L
62°00'N
APHEBIAN
Compton intrusions: diorite, quartz monzonite
Great Slave Supergroup
BLACHFORD LAKE COMPLEX
ARCHEAN
2-mica granite
Biotite granodiorite
Yellowknife Supergroup, Burwash formation
Altered syenite and mineralized veins
Thor Lake Syenite
Grace Lake Granite
Hearne Channel and Mad Lake Granites
Whiteman Lake Quartz Syenite
Caribou Lake Gabbro: gabbro / leucoferrodiorite

FIGURE 6-4: General geology of the Blatchford Lake Complex, after Davidson, 1982.

It is convenient to consider the Blatchford Lake Complex in two parts: the earlier, western part including the Caribou Lake gabbro, Whiteman Lake quartz syenite, Hearne Channel granite and Mad Lake granite, and the later, more extensive Grace Lake granite with its Thor Lake syenite core (Fig. 6-4). Rare element minerals are enriched in the later peralkaline units (Davidson, 1982).

Isotopic determinations indicate an early Aphebian age (2,150 Ma) for the Complex (Davidson, 1982). Bowring *et al.* (1984) obtained U-Pb zircon ages of 2175 ± 7 Ma for an older alkaline phase (Hearne Channel Granite) and 2094 ± 94 Ma for the younger peralkaline phase, the Thor Lake syenite.

Blatchford was incorrectly spelled as Blachford on many government maps and this spelling is still found in many references to the area.

THOR PROJECT

Highwood Resources Ltd.
12th Floor, 20 Toronto St.
Toronto, Ont., M5C 2B8

Be, Ta, Nb, REE,
Y, CaF_2, U, Th, Zr
85 I/1,2
62°07'N, 112°35'W

REFERENCES

Davidson (1972, 1978, 1982); de St. Jorre (1986); de St. Jorre and Smith (1988); Gibbins (1981, 1983a,b, 1984, 1985, 1987); Grasty and Richardson (1972); Pinckston and Smith (1988); Smith (1985); Smith and de St. Jorre (1985); Trueman (1984); Trueman *et al.* (1984, 1988).

PROPERTY

THOR 1-45; NB 1-172; DISA 1-5 and REO 1-3.

LOCATION

The claims are centred on a small lake 105 km southeast of Yellowknife, known informally as Thor Lake, which is half-way between Blatchford Lake, 5 km to the north, and Hearne Channel of Great Slave Lake, 5 km to the south.

HISTORY

The area was staked as ODIN 1-4 in 1970 and uranium, thorium and rare earth elements (REE) were noted, but little work was done and the claims lapsed.

A government airborne radiometric survey flown in 1971 outlined a significant uranium and thorium anomaly (Grasty and Richardson, 1972). Dr. A. Davidson of the Geological Survey of Canada mapped and defined the Blatchford Lake Complex and its central core, the Thor Lake syenite (Davidson, 1972, 1978).

During the fall of 1976, Highwood Resources Ltd. personnel discovered a number of previously undiscovered mineral showings north of the original ODIN claims and staked the THOR 1-4 claims. Additional claims were staked later when spectrographic analyses indicated quantities of niobium, yttrium and rare earth elements.

In 1977, Highwood Resources Ltd. did extensive prospecting, mapping, sampling and radiometric surveying, including trenching in the T Zone (Fig. 6-5) and 335 m of diamond drilling in the S Zone (Gibbins, 1981). In 1978, 1091 m were drilled in the Lake and T zones (Gibbins, 1983a).

In 1979, work was concentrated on the Lake Zone, where five trenches and five drillholes (136 m) were completed and sampled (Gibbins, 1983b, p. 174). Wayne Johnson of Target Exploration Services Ltd. mapped the southeast portion of the claims and did a soil radon survey over the Lake Zone in 1979. In September, a crew from the Saskatchewan Department of Mineral Resources did lake-bottom radiometric, resistivity and bathymetric surveys that defined a number of radiometric anomalies beneath the shallower parts of Thor Lake (Gibbins, 1983b).

In the spring of 1980, the claims were optioned to Placer Development Ltd. who, in 1980 and 1981, drilled 18 holes (2000 m) mainly in the Lake Zone (Gibbins, 1984). The cores were logged, sampled, and measured for magnetic susceptibility and radioactivity. Three sub-horizontal mineralized layers, 10 to 45 m thick, within 100 m of the surface in the Lake Zone were identified. These layers contain 63 Mt of indicated and inferred material grading 0.03% tantalum and 0.4% niobium (columbium) with significant amounts of rare earth elements (samarium 0.1%, cerium 1%, lanthanum 0.6%) and zirconium 3.5% (Highwood Resources Ltd., Annual Report, 1981). The T Zone contains 1.15 Mt of 0.55% Nb_2O_5 inferred material with a further 5.5 to 7 Mt probable material. Some 67 000 t of 1.5% Nb_2O_5 and 0.05% U_3O_8 are drill inferred in the S Zone, and an equal amount of similar grade is possible (Highwood Resources Ltd., Annual Report, 1980).

Placer Development Ltd. relinquished the option in the spring of 1982. Highwood Resources Ltd. resumed the role of operator, shipped a 4500 kg sample for metallurgical tests and did magnetometer and scintillometer surveys along the southern limits of the property.

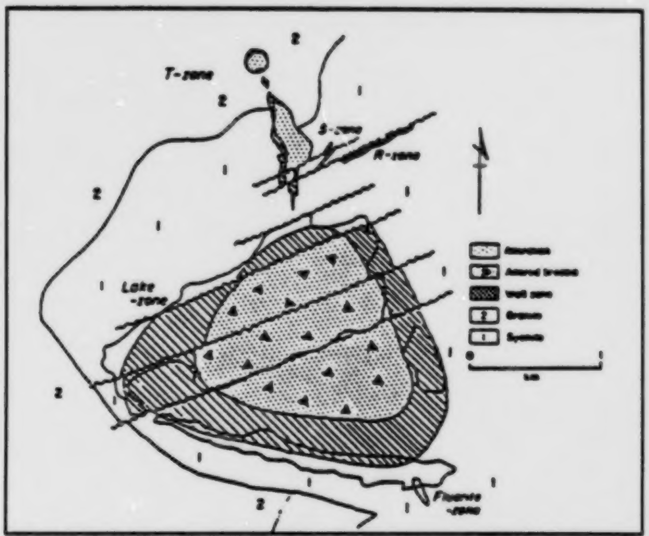


FIGURE 6-5: General geology of the Thor Lake area showing the distribution of granite and syenite, and the location of the T, Lake, R, S, and Fluorite zones, from Trueman et al. 1988.

Lake Zone

A gravity survey of the Lake Zone was completed in the spring of 1983 to provide insight as to the attitude of the mineralized zones. Modelling of the resulting Bouger gravity anomaly suggests that the tantalum-niobium-rare earth element zone extends downward in the form of an inverted cone for a few hundred metres (Trueman, 1984).

Structural studies of ultra-mylonite observed in core and outcrop, as well as offsets of lithologies, have indicated several fault systems that help explain and confirm the shape of the deposits (Fig. 6-5).

Three holes (465 m) drilled in the Lake Zone in the spring of 1984 indicate that a greater tonnage than the previously published reserve of 63 Mt probably exists at depth.

Metallurgical studies, using oil-phase extraction techniques to recover very fine-grained tantalum-niobium minerals, continued during 1983 and 1984.

Drilling during 1984 was not successful in isolating higher grade tantalum areas in the Lake Zone, but it did contribute to a revised estimate of inferred tantalum resources to 181.5 Mt (Highwood Resources Ltd., Annual Report, 1984).

T Zone

Following the recognition of important beryllium potential in the T Zone in 1983, exploration work was directed mainly toward defining grades and tonnages of this element. Work included re-logging drill core from the T Zone, detailed geological mapping (Fig. 6-6), a lithogeochemical survey to identify pathfinder elements, berylometer surveys of core and outcrops, stripping and trenching for bulk samples and a major drilling program from October 1983 to March 1984. This drilling outlined some 415 000 t of 1.0% BeO in the North T Zone and 1 180 000 t of 0.66% BeO in the South T Zone for a total of 1 595 000 t of 0.75% BeO to an approximate depth of 60 m. A total of 4174 m was drilled in 72 holes during the winter of 1983-84. The first two holes in the North T Zone intersected 21.3 m of 2.21% BeO, 3.0 m of 1.40% BeO, 21.6 m of 2.38% BeO, 4.6 m of 0.70% BeO and 12.2 m of 2.33% BeO. A 455 kg bulk sample from a pit in this area assayed 0.93% BeO over a length of 18.3 m. A second trench, 500 m south assayed 1.61% BeO over a 19.8 m length. A total of 76 m^2 was removed by trenching (Gibbins, 1985; Trueman *et al.*, 1984).

By the spring of 1984, over 100 drill holes in the T Zone had outlined two beryllium deposits, one of 434 550 t grading 1.4% BeO and another of 1 180 000 t of 0.66% BeO (Highwood Resources Ltd., Annual Report, 1984).

During the summer of 1984, geological mapping was completed on the T Zone and extended to cover the R, S, Lake and Fluorite zones. This work was accompanied by removal of

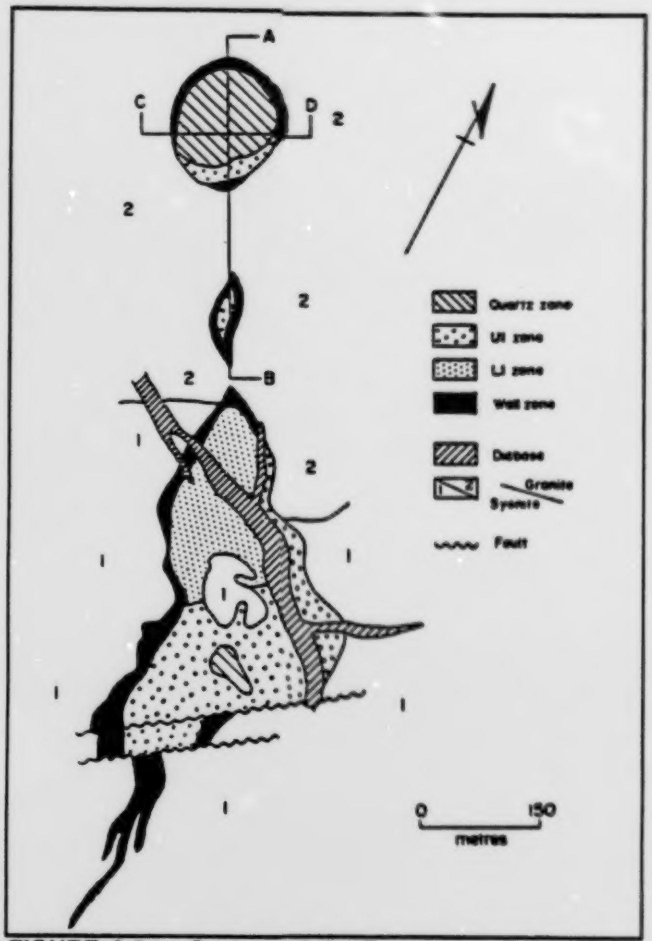

A
C
D
2
B
1
Quartz zone
UI zone
LI zone
Wall zone
Diabase
Granite
Syenite
Fault
0
150
metres

FIGURE 6-6a: *Geology of the T zone; map showing the location of sections A-B and C-D (from Trueman and others, 1988).*

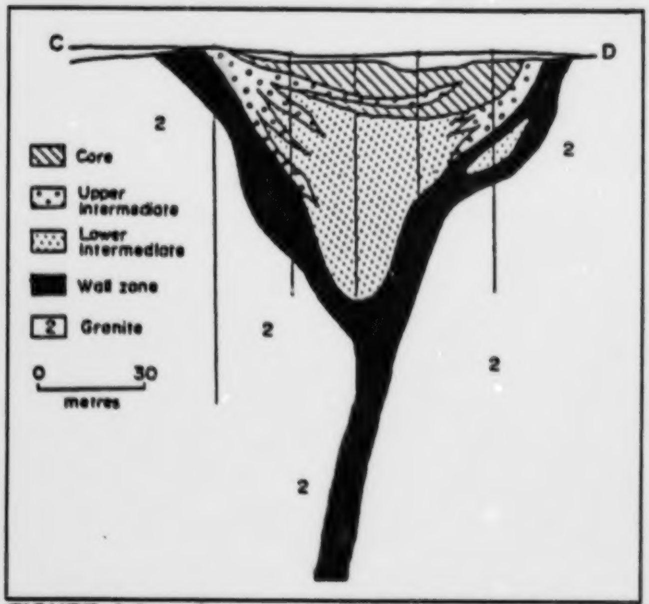

C
D
2
Core
Upper intermediate
Lower intermediate
Wall zone
Granite
0
30
metres

FIGURE 6-6c: *Geology of the T zone; cross section of the North T deposit (Trueman and others, 1988).*

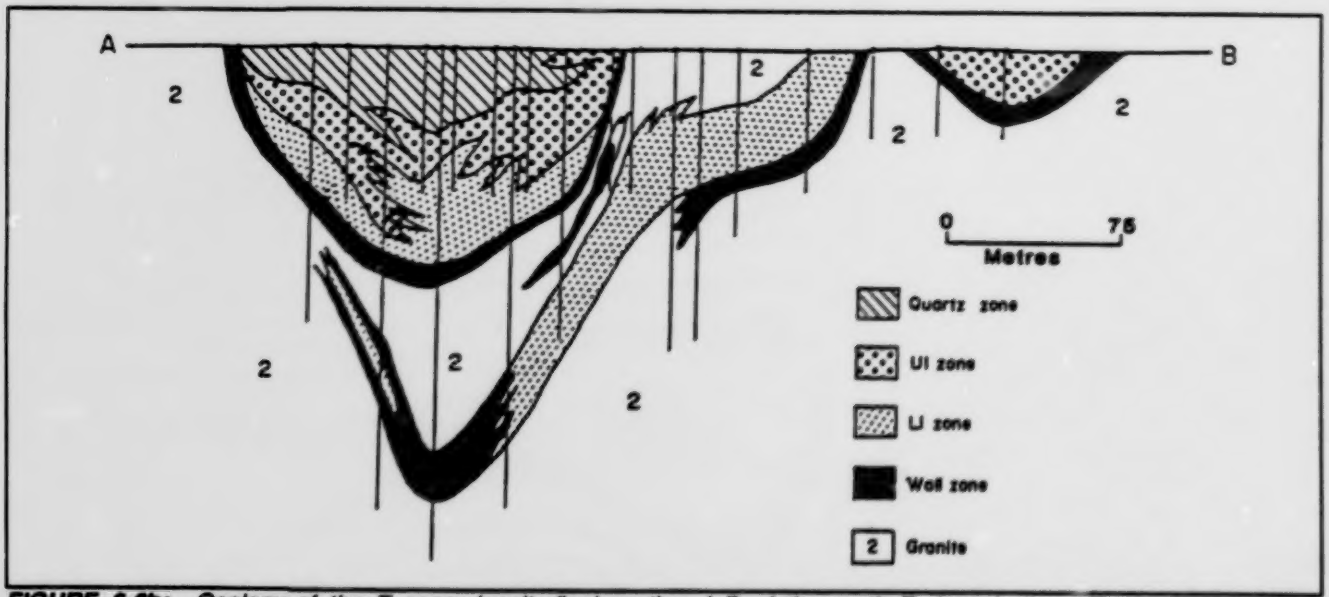

A
B
2
0
75
Metres
Quartz zone
UI zone
LI zone
Wall zone
Granite

FIGURE 6-6b: *Geology of the T zone; longitudinal section A-B of the north T deposit (from Trueman and others, 1988).*

overburden, drilling and blasting to obtain surface samples for assay control and the delineation of the mineralized areas.

Selected samples were taken from the beryllium-zone drill cores for mineralogical studies of the yttrium and rare-earth minerals. These sections were assayed for gadolinium, neodymium, and samarium as well as niobium and gallium. From this work, values have averaged 0.21% yttrium, over 1.0% niobium, 0.1% neodymium, 0.06% gadolinium, 0.12% samarium, 0.05% gallium and 0.9% cerium and lanthanum. Individual assays of core were as high as 1.28% yttrium oxide and 4.75% niobium oxide over 3 m indicating a profound enrichment of these metals in the beryllium zones. About 120 km of ice road was built on Great Slave Lake between Yellowknife and Thor Lake, and some 500 t of mining equipment and supplies were moved to Thor Lake in preparation for the 1985 underground program.

The highlight of the 1985 work at Thor Lake was the underground program contracted to Strathcona Mineral Services Ltd. of Toronto. A 500 m long decline was driven to a depth of more than 80 m in the beryllium-, yttrium- and REE-rich North T Zone, primarily to provide a bulk sample of the various sub-zones for metallurgical testing, but also to verify and compare assay and berylometer results with drill results. A 90 t bulk sample of material mined in the beryllium zones was shipped to Lakefield Research Ltd. of Lakefield, Ontario by year end (Gibbins 1987).

Between September and early December of 1985, 22 additional holes (1822.5 m) were drilled in the deposits between September and early December of 1985.

Mineralogical studies were undertaken in the Geology Department, University of Alberta (Smith and de St. Jorre, 1985; de St. Jorre and Smith, 1988; de St. Jorre, 1986). Specifically, the studies are concerned with the identification and nature of the various yttrium-, REE-, niobium- and gallium-bearing minerals and their distribution within the beryllium deposits of the T Zone and their sub-units (Table 6-1).

TABLE 6-1: LITHOLOGIC UNITS OF THE T-DEPOSIT, BLATCHFORD LAKE COMPLEX

6	**Quartz Zone**
5	**Upper Intermediate Zone**
	5A Quartz, Mica
	5B Quartz, Mica, Feldspar
	5C Quartz, Feldspar, ± Chlorite (5C/1, Brecciated Equivalents)
	5D Quartz, Feldspar, Mica, Magnetite
	5E Quartz, Bastnaesite
	5F Quartz, Thorite, Feldspar
4	**Lower Intermediate Zone**
	4A Quartz, Chlorite, Feldspar
	4B Chlorite, Feldspar, Carbonate, ± Quartz
	4C Quartz, Chlorite, Feldspar (Altered Granite)
	4D Chlorite, Feldspar (Altered Syenite)
	4E Quartz, Magnetite, Chlorite
3	**Wall Zone**
	3A Breccia
	3B Microclinite, Albitite
	3C Banded Aplite, Albitite
2	**Granite**
	2A Magnetite, Riebeckite
	2B Fluorite
	2C Berillian
	2D Other
1	**Syenite**

DESCRIPTION

The claims cover the central core of the Blatchford Lake Plutonic Complex known as the Thor Lake Syenite, a 30 km^2 oval in the centre of the Grace Lake Granite pluton (Figs. 6-4 and 6-5)(Davidson, 1978, 1982; Trueman *et al.*, 1984, 1988). Davidson (1978, p. 123) identified and mapped five varieties of syenite, based on textural and compositional differences. Trueman *et al.* (1988) added a sixth lithology, syenite pegmatite (Table 6-2).

TABLE 6-2: THOR LAKE SYENITE LITHOLOGIES, modified from Davidson (1978).

(1) "coarse- to medium-grained, dark green rusty weathering fayalite, pyroxene syenite;

(2) coarse-grained hornblende syenite;

(3) inequigranular hornblende syenite characterized by very coarse, highly poikilitic hornblende;

(4) subporphyritic hornblende syenite;

(5) medium-grained hornblende syenite with aligned hornblende crystals"; and

(6) syenite pegmatite.

An area of late stage veining, alteration and mineralization is centred on Thor Lake in the western part of the Thor Lake syenite (Fig. 6-5). This area contains five zones of Nb, Ta and REE enrichment along with high concentrations of Zr, Ga, Be, F and locally Y, Th and U. Patterns of element depletion and enrichment throughout the differentiated suite are consistent with the hypothesis that the observed alteration and mineralization are the end products of magmatic differentiation (Davidson, 1982).

Lake Zone

The Lake Zone is a 2 km^2 triangular-shaped area of dark, altered and brecciated rock beneath and south of Thor Lake (Fig. 6-5). It is the largest of the five mineralized zones and contains Nb, REE, Y and Zr. The Lake Zone has been subdivided into an outer Wall zone of pink to buff, massive, feldspar-rich rock and a central Core zone of brecciated diverse mineral types, mainly composed of albite, micas, quartz, magnetite and hematite (Fig. 6-5). The outer contact of the Wall zone with the enclosing Thor Lake Syenite is sharp, but the inner boundary is gradational with brecciated rock increasing toward the core (Trueman *et al.*, 1988). Pinckston and Smith (1988) recognized nepheline syenite in the Lake Zone. The nepheline syenite is in part altered, but is not enriched in incompatible elements and is believed to be a late stage intrusion.

Prior to 1988 drilling, 29 holes in the Lake Zone had outlined a resource of 65 Mt grading 0.03% Ta, 0.4% Nb, 1.7% combined REE and 3.5% Zr (Trueman *et al.*, 1988).

T Zone

The T Zone trends north-northwest away from the Lake Zone for approximately 1 km and varies in width up to 275 m (Fig. 6-5). It straddles the Grace Lake Granite-Thor Lake Syenite contact and offsets it (Fig. 6-6a). Trueman *et al.* (1988) recognized some 15 lithologies (Table 6-1), arranged as concentric to sub-horizontal shells, which can be grouped into four zones (Fig. 6-6).

The Wall zone, which mantles the T Zone, is a pink to buff weathering, massive unit of variable texture and mineralogy. As in the Lake Zone, the Wall zone is dominated by relict microcline, albite and minor quartz. Columbite is a common accessory mineral, and high gallium contents are associated with feldspars, substituting for trivalent aluminum (Trueman *et al.*, 1988; de St. Jorre and Smith, 1988).

The Lower Intermediate zone, comprising five lithologies (Table 6-1), contains beryllium in the mineral phenacite, and yttrium and rare-earth elements in an intimate admixture of a metamict species believed to be thorite. Niobium is in the mineral columbite, which formed in massive granular and radiating spicular aggregates.

The Upper Intermediate zone is transitional to the Lower Intermediate and Quartz zones, and is largely dominated by quartz-polylithionite-albite assemblages. It is an important host for beryllium, and less so for by-product yttrium, rare earths and niobium. Polylithionite is of interest for its lithium and rubidium content (Trueman *et al.*, 1988).

The Quartz zone occupies the core of the North T Zone and patchy areas of the south (Fig. 6-6). It is essentially monomineralic consisting of white and greyish translucent quartz.

A total of 124 drill holes in the T Zone has outlined 1.6 Mt grading 0.85% BeO, including 435 000 t of 1.4% BeO, 0.26% Y_2O_3, plus Nd, Sm, Gd, and Ga (Trueman *et al.*, 1988).

CURRENT WORK AND RESULTS

In 1986, Highwood Resources Ltd. completed the crushing and splitting of the bulk samples obtained from the 1985 underground operation. A 12 km road was built between the mine portal and the Hearne Channel on Great Slave Lake. Some 680 t of mineralized rock were shipped by winter road and rail to Lakefield Research for metallurgical testing.

Highwood Resources finalized an agreement with Hecla Mining Corporation in 1986, whereby Hecla Mining would conduct and finance the ongoing research and exploration of the Thor Lake deposits, and, pending the completion of a satisfactory feasibility study, arrange the necessary capital funding to bring the property into production.

A formal marketing study was commissioned in the fall of 1986 by Hecla Mining to quantify the markets for, and future growth of, beryllium and related by-products from Thor Lake. This study, which indicated there will be significant growth in consumption of beryllium (6% annually), was continued by the Highwood/Hecla joint venture in order to provide further confirmation of the data and to continue market development. The joint venture initiated talks with interested processors and consumers in the United States, Japan and Europe and investigated sales of concentrates, refined products and alloys.

In 1987, the Highwood Resources Ltd./Hecla Mining Co. joint venture continued metallurgical, feasibility and marketing studies. Beryllium hydroxide, produced from Thor Lake beryllium concentrate, was provided to potential customers. Environmental and geotechnical studies were also undertaken.

Mineralogical studies of the T Zone (de St. Jorre, 1986; de St. Jorre and Smith 1988) and the Lake Zone (Pinckston and Smith, 1988) at the University of Alberta continued to identify beryllium- and REE-bearing minerals and their distribution.

PGM CLAIMS

Highwood Resources Ltd.	Platinum Group Elements
12th Floor, 20 Toronto St.	85 I/2
Toronto, Ont., M5C 2B8	62°06'N, 112°48'W

REFERENCES

Davidson (1972, 1978, 1982); Pinckston and Smith (1988).

PROPERTY

PGM 1-6.

LOCATION

The claims are east and northeast of Francois Bay, north shore of Hearne Channel about 100 km southeast of Yellowknife. The area is centred near the south end of Caribou Lake and extends from the Hearne Channel to Whiteman Lake.

The claims include the Caribou Lake gabbro (Fig. 6-4).

HISTORY

The claims were recorded in January 1987.

DESCRIPTION

The Caribou Lake gabbro, which underlies the claims, is exposed only on the western side of the Blatchford Lake alkaline complex (Davidson, 1972, 1978, 1982)(Fig. 6-4). It is intruded by younger units of the Blatchford Lake Intrusive Suite to the east, whose emplacement has removed much of what must have been a considerably larger pluton. It varies in lithology from olivine gabbro to leuco-ferrodiorite, and includes chilled, pegmatitic, noritic and anorthositic phases. Pinckston and Smith (1988) also reported pyroxenites and previously unreported anorthosites in the Caribou Lake gabbro.

CURRENT WORK AND RESULTS

In 1987, Highwood personnel prospected and sampled phases of the Caribou Lake gabbro for platinum group elements.

TALTSON MAGMATIC ZONE

The Taltson Magmatic Zone (Fig. 6-2) is a belt of granitic to dioritic plutons that extends southward along the edge of the exposed Precambrian Shield (Bostock *et al.*, 1987). These plutons have been dated between 1.93 and 1.92 Ga from zircon and monazite using U-Pb methods. Like the Thelon Magmatic Zone, the belt contains magnetite and ilmenite series plutons that produce positive and negative magnetic anomalies respectively. A transition zone of north-trending sinistral shear zones (Culshaw, 1984; Bostock *et al.*, 1987) separates the magmatic zone and Archean rocks. The Archean rocks are overlain to the east by sinistral pull-apart basins (Nonacho Group). Metamorphic grade of the Archean rocks is significantly lower than in the Queen Maud uplift (Bostock *et al.*, 1987).

RUTLEDGE LAKE PROJECT

Enexco International Ltd.
P.O. Box 12508
1120, 1066 W. Hastings St.
Vancouver, B.C., V6E 2E6

Copper, Nickel, PGEs
75 E/7,10,15
61°37'N, 110°47'W

REFERENCES

Bostock (1988); Bostock *et al.* (1987); Culshaw (1984a,b); Fyson (1985); Gibbins (1985).

DIAND assessment reports: 082098 (1986), 082489 (1987).

PROPERTY

LEA 1-20, ENEX 1-10, WWK 1-12.

LOCATION

The claims are centred on and include most of Rutledge Lake and adjacent shorelines. Rutledge Lake is about 200 km southeast of Yellowknife and 180 km north-northeast of Fort Smith (Fig. 6-1).

HISTORY

Mr. W.W. Kizan and Mr. Lloyd Anderson first prospected at Rutledge Lake in 1980 after having sighted gossans from the air during flights across the lake. In late 1980 Mr. Kizan brought rock and mineral specimens to Trigg Woollett Consulting Ltd.'s office where they were determined to be of volcanic origin.

In September 1981, Trigg Woollett Consulting Ltd. geologists spent several days in the Rutledge Lake area trying to define the margins of the belt. Mapping showed the belt to be at least 60 km long, tapering rapidly at the north and south ends. The maximum width of the belt is 17.5 km. More than 70 gossans and 41 sulphide mineral showings were identified during the reconnaissance mapping; about 75% of these are within the belt of intermediate rocks. Only three of the sulphide showings were examined in detail. The LEA 1-20 claims were staked in the fall of 1981.

During 1982, prospectors Kizan and Anderson continued to prospect the area. They collected numerous samples that returned low but interesting assays for copper, nickel, cobalt, molybdenum, lead, gold and silver.

Questor Surveys Ltd. flew 2211.5 km of Standard Mark IV INPUT-EM and magnetic survey over the Rutledge Lake area in July and August, 1983 (Gibbins, 1985). Twelve class 1, nineteen class 2 and five class 3 conductive-magnetic zones were outlined; four (43 C, 62 G, 86 B and 146 C) were recommended for immediate attention. Two areas of conductive lake bottom sediments were identified; they are very distinctive and not common in the area.

Trigg Woollett Consulting Ltd. prospected, cut grid lines, mapped, did VLF EM and magnetic surveys and collected soil and rock chip samples from five priority INPUT-EM/magnetic targets.

Paterson, Grant and Watson Ltd. was contracted to synthesize and re-interpret the 1983 geophysical work. The raw aeromagnetic data was modified to produce apparent magnetic susceptibility maps by calculating the magnetic susceptibility distribution in the ground that would be required to produce a total magnetic field contour map identical to the one measured. On this map the regional gradient is effectively removed and a measure of the local susceptibility is provided. The magnetic susceptibility map formed the basis of a new geological interpretation which is similar regionally but markedly different in detail than the Trigg Woollett map.

The Paterson, Grant and Watson Ltd. interpretation recognized three principal magnetic terrains, consisting of low, intermediate and high magnetic relief. They also recognized 81 single or multiple INPUT conductors and observed that the magnetic susceptibility anomalies are confined, both along strike and laterally, to the regions of highest conductivity.

Five priority ratings (A, A-, B, B- and C) were assigned to the 81 INPUT conductors. These ratings, along with other factors such as size, shape, geological environment and accessibility, were used to select conductors for further work. Paterson, Grant and Watson Ltd. suggested that ground EM using horizontal loop (i.e., Max-Min) is preferable to VLF EM, because widespread pyrrhotite will make it important to find the main axis of the airborne conductor.

The WWK 1-2 were recorded in January 1985 and the ENEX 1-10 claims in October 1985 to protect INPUT conductors outside the LEA claims.

DESCRIPTION

The Rutledge Lake area is near the eastern edge of the Taltson Magmatic Zone (Fig. 6-2)(Bostock *et al.*, 1987). Rutledge Lake is underlain by a north-trending belt of granite gneiss and paragneiss (unit 1 of Culshaw, 1984a,b, Fig. 6-7; and unit 2 of Bostock, 1988). Culshaw referred to this belt as the Rutledge Lake Complex. It is intruded by a 4 by 1.5 km oval body of charnockite (hypersthene granite) near the north end of Rutledge Lake.

Fine- to medium-grained bands and lenses of mafic to ultramafic rocks are in the paragneisses and within and along the margins of the charnockite (Fyson, 1985). In many of these lenses (units 7 and 8 in Fig. 6-7) there are small rusty zones of sulphides, mainly pyrrhotite and chalcopyrite, with anomalous amounts of copper, nickel and precious metals.

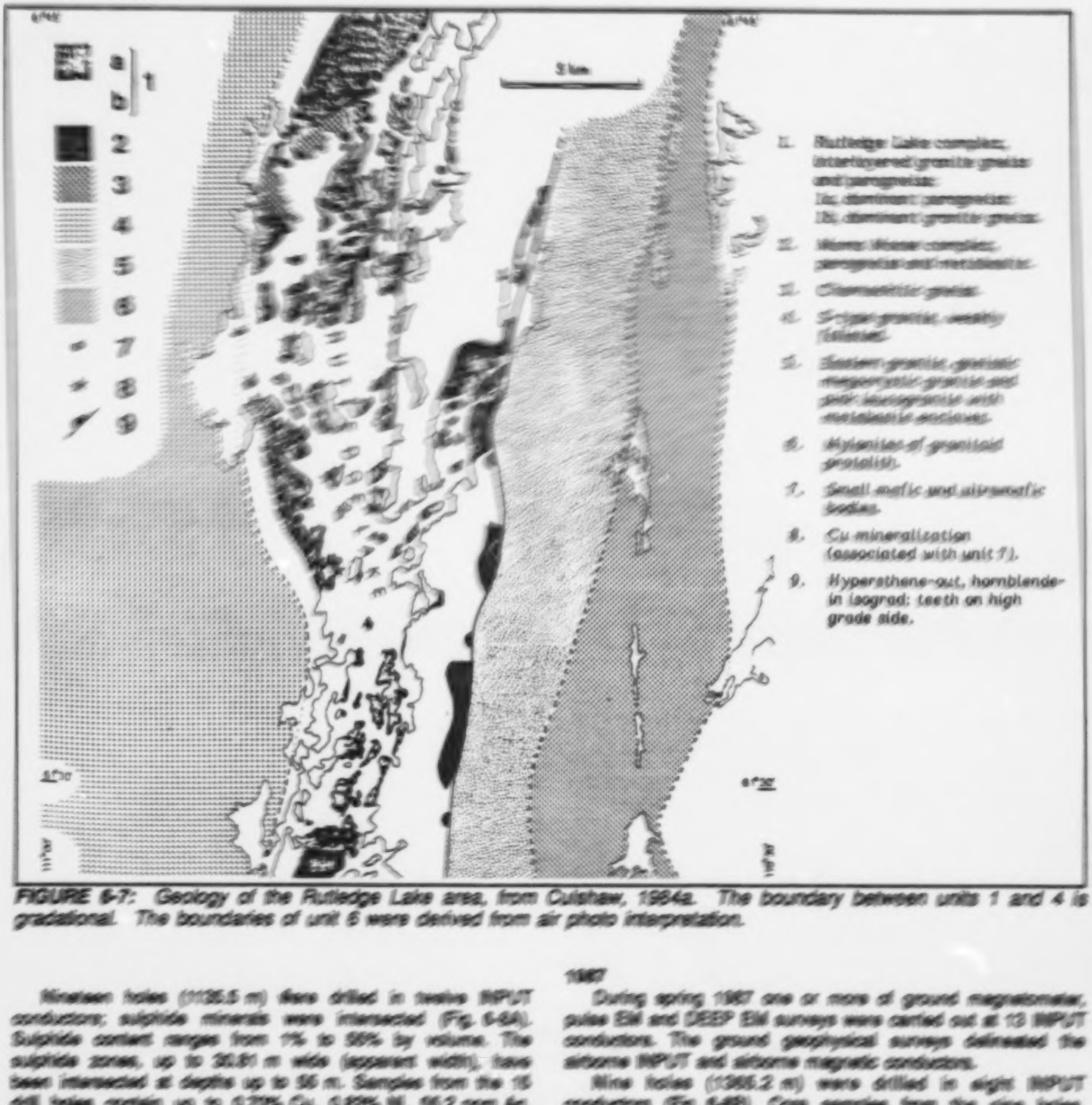
Trigg Woollett Olson Consulting Ltd. determined that the mafic to ultramafic rocks from Rutledge Lake comprise pyroxenite, anorthosite, peridotite, olivine gabbro and minor amounts of serpentinite. Elevated platinum, palladium and gold contents are associated with pyroxenite or peridotite and are not always directly associated with sulphide minerals. The genesis of these rocks is unclear, but is possibly related to peridotitic magmatism associated with intracratonic rifting along the Thelon Tectonic Zone and analogous to the Thompson Nickel Belt (DIAND assessment report 082489).

CURRENT WORK AND RESULTS

During August to September 1986 and April to March 1987, Trigg Woollett Olson Consulting Ltd. did detailed geological mapping and Paterson, Grant and Watson Ltd. did nearly 200 line-km of magnetometer and EM surveys on grids covering 24 INPUT conductors (Fig. 6-8)(DIAND assessment reports: 082098, 082489). At the same time 28 holes, totalling 2500 m, were drilled to test many of these INPUT conductors.

1986

Thirteen INPUT conductors were explored in 1986. INPUT conductors chosen for 1986 work were determined by the need to satisfy assessment requirements. Ground magnetometer and Turam EM surveys successfully delineated eight of the airborne INPUT anomalies.



a
b
1
2
3
4
5
6
7
8
9
5 km
1. Rutledge Lake complex: interlayered granite gneiss and paragneiss: 1a, dominant paragneiss: 1b, dominant granite gneiss.
2. Mara River complex: paragneiss and metabasite.
3. Charnockitic gneiss.
4. S-type granite, weakly foliated.
5. Eastern granite, gneissic megacrystic granite and pink leucogranite with metabasite enclaves.
6. Mylonites of granitoid protolith.
7. Small mafic and ultramafic bodies.
8. Cu mineralization (associated with unit 7).
9. Hypersthene-out, hornblende-in isograd; teeth on high grade side.
61°30'
111°45'
110°45'

FIGURE 6-7: Geology of the Rutledge Lake area, from Culshaw, 1984a. The boundary between units 1 and 4 is gradational. The boundaries of unit 6 were derived from air photo interpretation.

Nineteen holes (1135.5 m) were drilled in twelve INPUT conductors; sulphide minerals were intersected (Fig. 6-8A). Sulphide content ranges from 1% to 95% by volume. The sulphide zones, up to 30.81 m wide (apparent width), have been intersected at depths up to 96 m. Samples from the 19 drill holes contain up to 0.70% Cu, 0.83% Ni, 96.2 ppm Ag, 320 ppb Au, 1250 ppb Pt and 230 ppb Pd. In this report, concentrations of 0.08% Cu, 0.08% Ni, 30 ppb Au, 50 ppb Pt, and 5 ppb Pd are used to distinguish between low and elevated levels of these elements. Elevated concentrations of one or more of these metals were found across core lengths of 1 to 3 m. Elevated concentrations of silver, gold, platinum and palladium are primarily within sulphide breccia or massive sulphide that is associated with pyroxene, chlorite, plagioclase or dark quartz.

1987

During spring 1987 one or more of ground magnetometer, pulse EM and DEEP EM surveys were carried out at 13 INPUT conductors. The ground geophysical surveys delineated the airborne INPUT and airborne magnetic conductors.

Nine holes (1365.2 m) were drilled in eight INPUT conductors (Fig. 6-8B). Core samples from the nine holes, which were drilled during spring 1987, contain up to 1900 ppm Cu across 0.10 m core length, 2000 ppm Ni across 0.11 m core length, 135 ppb Au across 0.11 m core length, 50 ppb Pt across 1.70 m core length and 55 ppb Pd across 0.11 m core length. These anomalous concentrations of metals are primarily within mafic rock comprising or 3 or more of pyroxene, chlorite, plagioclase, dark quartz and sulphides.

As of June 30, 1987 Enexco International Ltd. and associated companies retained the following claims in good standing: LEA 1-17, 20; ENEX 3-5, 7; and WKK 1-5, 9, 10 12, encompassing 28 000 ha.

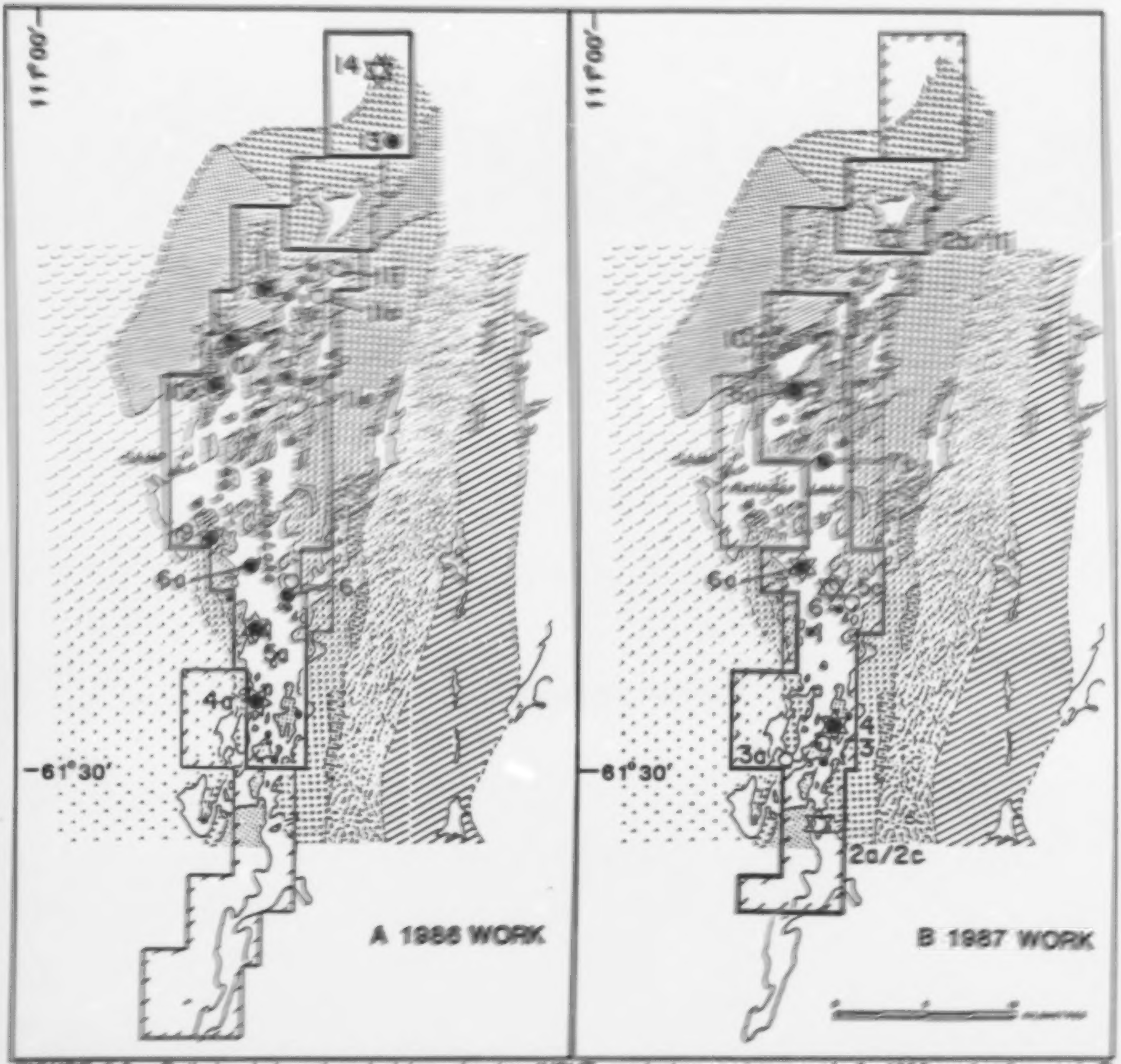

111°00'
14
13
11
11b
11c
12
11a
9
6a
6
5a
4a
-61°30'
A 1986 WORK
111°00'
2b/11
10
8a
6a
5a
6
4
3
3a
2a/2c
-61°30'
B 1987 WORK

FIGURE 6-6: Rutledge Lake mineral claims showing INPUT conductors and areas of: A, 1986 exploration and; B, 1987 exploration.

SOUTHERN RAE PROVINCE

The Rae Province (Fig. 6-2) is an Archean granite-greenstone-gneiss-granulite terrane (Hoffman, 1988a). It is bounded on the west by younger rocks of the Taltson Magmatic Zone and separated from similar rocks of the Hearne Province on the southeast by the Snowbird tectonic zone.

ENNADAI PROJECT

Athabaska Gold Resources Ltd.	Gold
801, 850 W. Hastings St.	65 D/3,4
Vancouver, B.C., V6C 1E1	(64 M/13,14)
	60°N, 103°30'W

REFERENCES

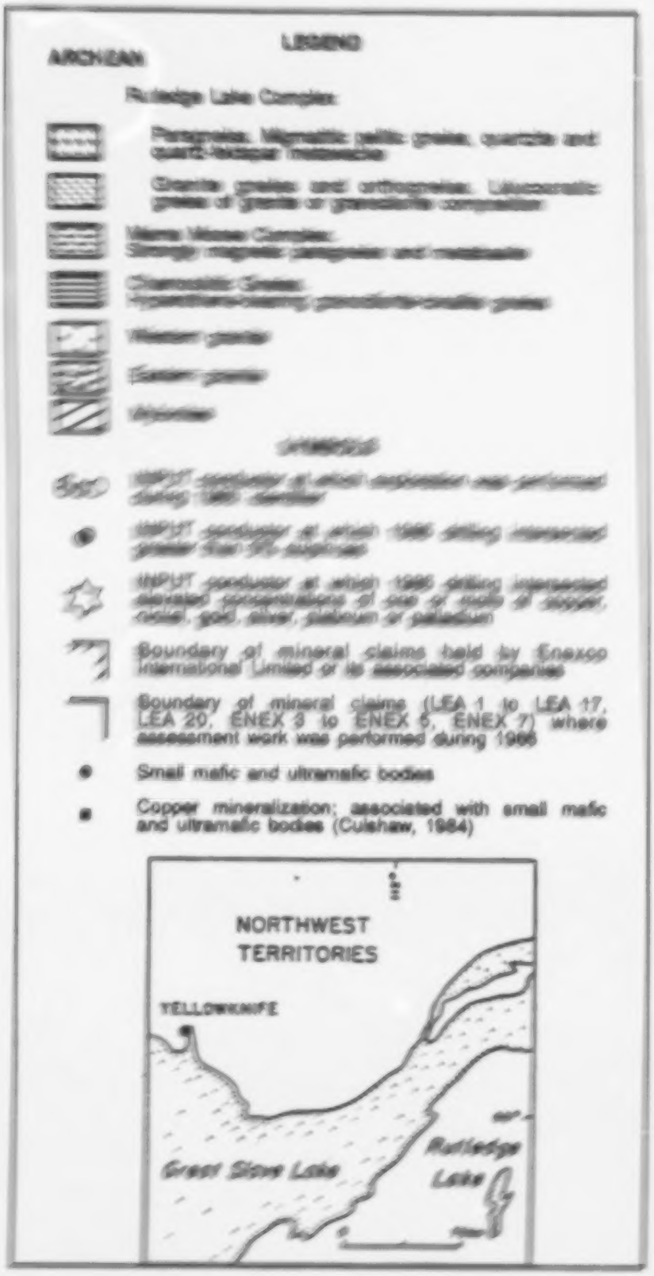
Metcalfe (1987); Schreiner (1984); Taylor (1963). DIAND assessment report: 082873.

PROPERTY

ENN 1-3, ESK 1-12, (HAT 1-3, in Saskatchewan).

LOCATION

The claims straddle the NWT-Saskatchewan border at latitude 103°30'W, about 15 km east of Striding Lake and


LEGEND
ARCHEAN
Rutledge Lake Complex:
Paragneiss. Migmatitic pelitic gneiss, quartzite and quartz-feldspar metawacke
Granite gneiss and orthogneiss. Leucocratic gneiss of granite or granodiorite composition
Mama Moose Complex:
Strongly magnetic paragneiss and metabasite
Charnockitic Gneiss:
Hypersthene-bearing granodiorite-tonalite gneiss
Western granite
Eastern granite
Volcanics
SYMBOLS
INPUT conductor at which exploration was performed during 1986
INPUT conductor at which 1986 drilling intersected greater than 5% sulphides
INPUT conductor at which 1986 drilling intersected elevated concentrations of one or more of copper, nickel, gold, silver, platinum or palladium
Boundary of mineral claims held by Enexco International Limited or its associated companies
Boundary of mineral claims (LEA 1 to LEA 17, LEA 20, ENEX 3 to ENEX 5, ENEX 7) where assessment work was performed during 1986
Small mafic and ultramafic bodies
Copper mineralization; associated with small mafic and ultramafic bodies (Culshaw, 1984)
NORTHWEST TERRITORIES
YELLOWKNIFE
Great Slave Lake
Rutledge Lake

15 km southeast of Atzinging Lake.

The area is 550 km east-southeast of Yellowknife and 475 km east of Fort Smith. The nearest communities are Stony Rapids 150 km to the southwest, and Points North 150 km to the south in Saskatchewan.

HISTORY

The Ennadai project comprises 18 contiguous claims (25 551 ha) along the border of northeastern Saskatchewan and south-central NWT (southeast District of Mackenzie). The claims were recorded in August 1987 for precious and base metal potential.

Extensive work was conducted on the Saskatchewan side of the border from 1984 to 1986 by Saskatchewan Mining Development Corporation (SMDC, now CAMECO) and in 1987 by East West Resource Corporation on permits now covered by mineral claims HAT 1, HAT 2 and HAT 3.

Mapping by SMDC identified a broad belt of mafic to intermediate metavolcanics which grades through a transition zone into turbidite metasediments. Geophysical and geochemical surveys outlined both oxide-facies and sulphide-facies iron formation, some containing anomalous amounts of gold. The most significant discovery, the Nirdac Creek zone, is a silicate/sulphide-facies iron formation boulder train. Samples from 25 boulders assayed between 3.45 and 28.46 g/t Au. Core from one hole, drilled at the apex of the boulder train, assayed 13.75 g/t Au over 1.5 m.

In 1987, East West Resources drilled six of seventeen diamond drill holes into the Nirdac Creek gold zone. Five of these intersected sulphide/silicate-facies banded iron formation. The best intersection assayed 5.26 g/t Au over 2.5 m (Metcalfe, 1987).

DESCRIPTION

The claims are near the southwestern-most end of the Archean Ennadai greenstone belt. Taylor (1963) divided this belt into three units: metasedimentary rocks, chiefly metagreywacke with some quartzite and minor iron formation; metavolcanic rocks, chiefly basalt and tuff; and intercalated metavolcanic and metasedimentary rocks. Gneissic granite and paragneiss lie to the northwest of the belt. Plutons ranging from granite to gabbro intruded the area.

A pervasive layer of Quaternary glacial till, sand, silt and gravel covers 95% of the Ennadai surface area. Streamlined land forms (eskers, drumlins, etc.) and rare glacial striae suggest a predominant ice movement from the northeast at about 30° (Schreiner, 1984). Glacial topography is dominated by glaciofluvial terrain (eskers, kames, kettles), hummocky moraines, moraine plains (till plains, fluted or drumlinized ground), organic terrain (muskeg) and more rarely by felsenmeer (Schreiner, 1984).

CURRENT WORK AND RESULTS

In 1987, 68 boulder and outcrop samples were collected and analyzed, but no anomalous gold concentrations were detected. A 30 by 100 m gossan in eastern ESK 6 produced samples ranging from 2 to 10% pyrite which were essentially devoid of gold and base metals.

HUB 1 CLAIM

W. A. Hubacheck	Gold, Silver
Consultants Ltd.	65 D/16
Suite 903, 141 Adelaide St. W	60°52'N, 102°08'45"W
Toronto, Ont., M5H 3L5	

Agnico-Eagle Mines Ltd.
2302, 401 Bay St.
P.O. Box 102
Toronto, Ont., M5H 2Y4

REFERENCES

Lord (1953); Taylor (1963).
DIAND assessment reports: 062077, 082852.

PROPERTY

HUB 1.

LOCATION

The HUB 1 claim is about 22 km north of Kasba Lake and 27 km east of the northern tip of Snowbird Lake. It covers the central part of a westerly trending greenstone belt, 3 km west of the end of a long irregular-shaped bay of northwestern Rochon Lake and 4 to 5 km west of the boundary between the districts of Keewatin and Mackenzie.

HISTORY

Canico Ltd. (Inco Ltd.) discovered an airborne EM anomaly and lens-shaped gossans in the area in 1953. The HUB claim area was held as TOP 4 and 5 by Rio Tinto in 1964. Four trenches were excavated in rusty, sheared mafic volcanics with numerous quartz stringers. The highest assay from the trenches was 11.7 ppm Au. Subsequent trenches may have been made by Gulf Minerals Canada Ltd. or Phelps Dodge Corp. who explored the Rochon Lake area for base metals from 1974 to 1978. The HUB 1 claim was staked by H. Vouri in July 1987.

DESCRIPTION

The claims are underlain by an easterly trending belt of metavolcanic rocks (Taylor, 1963). A 1 to 1.5 km wide conductive band of chloritic and amphibolitic schists dips 45 degrees to the north. Gold has been found in the same belt of volcanic rocks to the east at Ennadai Lake (Lord, 1953, p. 9).

CURRENT WORK AND RESULTS

In 1987, the HUB 1 claim was geologically mapped, and magnetometer and VLF EM surveys were done over a pace and compass grid. Several VLF EM anomalies roughly coincident with high magnetic values and gradients were discovered. VLF conductors just north of the base line reflect isoclinally folded sulphides within amphibolite-facies iron formation. Gold is hosted within stratabound sulphides which have undergone partial or complete mobilization into fold noses. Dilatant zones within noses of larger folds may have played a significant role in enrichment of stratabound sulphides to economic grades.

Lens-shaped gossans, 8 by 15 m, are at 10+85E and 17+80E. Sulphide minerals consist of disseminated grains and streaks of pyrite, pyrrhotite and rare chalcopyrite. Boudins of barren bull quartz up to 1 m long and 30 cm in width are localized in small-scale boudinage drag folds en-echelon with the gossans.

The most encouraging assay, 2.88 g/t Au, was from a felsenmeer.

THE GREAT SLAVE PLAIN

The Great Slave Plain is that part of the Interior Plains between latitudes 60° and 64°N and between the Franklin Mountains and the western edge of the Precambrian Shield in the vicinity of Great Slave Lake. It is underlain mainly by Paleozoic carbonates, evaporites and shales and has a relatively flat topographic surface, generally less than 300 m in elevation, that is characterized by sparse outcrop, abundant swamp, sink holes and karst topography. The Horn Plateau, which consists of Mesozoic strata, is a broad, smooth upland rising to 835 m in elevation.

The Great Slave Plain includes the Pine Point Lead-Zinc District, the source of a large proportion of the Northwest Territories' annual production of minerals from 1964 to 1987 (see Chapter 2). Because of extensive overburden, the flat-lying attitude of the host rocks and the nature of Pine Point type Pb-Zn deposits, exploration is mainly by IP surveys (Lajoie and Klein, 1979; Seigel *et al.*, 1968) and fence or grid drilling. Attempts to find deposits using rock and soil geochemistry, gravity and EM surveys have not been as cost effective. Most exploration work is done in the winter months when the widespread swamps and muskegs are frozen.

The geology and exploration philosophy has been discussed by several workers: Campbell (1967), Skall (1975), Rhodes *et al.* (1984), Carter (1983), Krebs and Macqueen (1984), Webb (1986), and Webb and Macqueen (1985). The geology of the area has been mapped and discussed by Douglas and Norris (1974) and Norris (1965).

CURRENT WORK AND RESULTS

1986

At Pine Point Mines Ltd., exploration expenditures in 1986 totalled $2.2 million compared with $4.3 million in 1985. An internally funded program budgeted at $2 million was replaced in May with a $2 million exploration program, funded largely by a flow-through share issue. This program continued until February 1987.

Exploration, mainly geophysical surveys and diamond drilling, was concentrated in the eastern part of the property where ore deposits were more likely to have low strip ratios and low dewatering costs. A large, low-grade mineralized structure containing a small ore-grade deposit was located. The structure lies stratigraphically below the normal ore-bearing horizon.

Drilling an area of known mineralized zone near the mill led to the definition of additional ore at the P-41 deposit. A small prismatic ore body of 140 600 t with grades of 8.0 % Zn and 2.2 % Pb was outlined.

1987

Exploration expenditures in 1987 totalled $2.0 million compared with $2.2 million in 1986. Geophysical surveys and diamond drilling were concentrated in the central and eastern parts of the property where any ore deposits found would be more likely to have lower strip ratios and lower dewatering costs. The program was unsuccessful in locating new ore.

No further exploration is planned for the Pine Point Lead-Zinc District.

REFERENCES

Badham, J.P.N., 1978:
Magnetite-Apatite-Amphibole-Uranium and Silver-arsenide mineralizations in Lower Proterozoic Igneous rocks, East Arm, Great Slave Lake, Canada; Economic Geology, v. 73, p. 1474-1491.

Badham, J.P.N., and Muda, M.M.Z., 1980:
Mineralogy and paragenesis of hydrothermal mineralizations in the East Arm of Great Slave Lake; Economic Geology, v. 75, p. 1220-1238.

Bostock, H.H., 1988:
Geology of the north half of the Taltson Lake map area, District of Mackenzie; *in* Current Research; Geological Survey of Canada, Paper 88-1C, p. 189-198.

Bostock, H.H., van Breemen, O., and Loveridge, W.D., 1987:
Proterozoic geochronology in the Taltson Magmatic Zone, NWT; *in* Radiogenic Age and Isotopic Studies: Report 1, Geological Survey of Canada, Paper 87-2, p. 73-80.

Bowring, S.A., Van Schmus, W.R., and Hoffman, P.F., 1984:
U-Pb zircon ages from Athapuscow Aulacogen, East Arm of Great Slave Lake, NWT; Canadian Journal of Earth Science, v. 1, p. 1315-1324.

Campbell, N., 1967:
Tectonics, reefs and stratiform lead-zinc deposits of the Pine Point area, Canada; Economic Geology Monograph 3., p. 59-70.

Carter, K., 1983:
Geology of the N-81 orebody, Pine Point, NWT; CIM Bulletin, v. 76, no. 855, p. 38.

Culshaw, N.G., 1984a:
Rutledge Lake, NWT; a section across a shear belt within the Churchill Province; *in* Current Research, Geological Survey of Canada, Paper 84-1A, p. 331-338.

______, 1984b:
Rutledge Lake area, District of Mackenzie; NWT Geology Division, DIAND, EGS 1984-3.

Davidson, A., 1972:
Granite studies in the Slave Province; *in* Report of Activities; Geological Survey of Canada, Paper 72-1A, p. 109-115.

______, 1978:
The Blatchford Lake intrusive suite: an Aphebian alkaline plutonic complex in the Slave Province, NWT; *in* Report of Activities, Geological Survey of Canada, Paper 78-1A., p. 119-127.

______, 1982:
Petrochemistry of the Blatchford Lake complex near Yellowknife, NWT; *in* Uranium in Granites, ed. Y.T. Maurice; Geological Survey of Canada, Paper 82-23, p. 71-79.

de St. Jorre, L., 1986:
Mineralogy of the T-Zone Beryllium Deposits, Thor Lake, NWT; M.Sc. thesis, University of Alberta, 248 p.

de St. Jorre, L. and Smith, D.G.W., 1988:
Cathodoluminescent gallium-enriched feldspars from the Thor Lake rare-metal deposits, Northwest Territories; Canadian Mineralogist., v. 26, p. 301-308.

Douglas, R.J.W., and Norris, A.W., 1974:
Great Slave, NTS 85 SE, District of Mackenzie; Geological Survey of Canada, Map 1370A.

Fyson, M. 1985:
Geochemistry, phase relations, and geothermometry as indications of primary rock history and conditions of metamorphiem at Rutledge Lake, NWT; *in* Contributions Geology of the NWT, v. 2; NWT Geology Division, DIAND, EGS 1985-86, p. 35-54.

Gibbins, Walter A., 1981:
Western Churchill Prov.; *in* Mineral Industry Report, 1977, NWT; NWT Geology Division, DIAND, EGS 1981-11, p. 58-67.

______, 1983a:
Southeast Mackenzie District; *in* Mineral Industry Report, 1978, NWT; NWT Geology Division, DIAND, EGS 1983-2, p. 60-79.

______, 1983b:
Southeast Mackenzie District; *in* Mineral Industry Report, 1979, NWT; NWT Geology Division, DIAND, EGS 1983-9, p. 129-176.

______, 1984:
Southeast Mackenzie District; *in* Mineral Industry Report, 1980-81, NWT; NWT Geology Division, DIAND, EGS 1984-85, p. 203-284.

______, 1985:
Southeast Mackenzie District; *in* Mineral Industry Report, 1982-83, NWT; NWT Geology Division, DIAND, EGS 1985-4, p. 203-284.

______, 1987:
Southeast Mackenzie District; *in* Mineral Industry Report, 1984-85, NWT; ed. C.E. Ellis, p. 125-150.

Gibbins, Walter A., Seaton, J.B., Laporte, P.J., Murphy, J.D., Hurdle, E.J., and Padgham, W.A., 1977:
Mineral Industry Report, 1974, NWT; NWT Geology Division, DIAND, EGS 1977-5, 267 p.

Gresty, R. L. and Richardson, D.A., 1972:
Gamma-spectrometer survey of an area north of Great Slave Lake and the islands of the East Arm of Great Slave Lake, NWT; Geological Survey of Canada, Open File 124.

Hoffman, P.F., 1977:
Preliminary geology of Proterozoic formations in the East Arm of Great Slave Lake; Geological Survey of Canada, Open File 475.

______, 1981:
Autopsy of Athapuscow Aulacogen: A failed arm affected by three collisions: *in* Proterozoic basins of Canada; F.H.A., ed. Campbell; Geological Survey of Canada, Paper 81-10, p. 97-102.

______, 1987:
Continental transform tectonics: Great Slave Lake shear zone (1.9 Ga), northwest Canada; Geology v. 15, p. 785-88.

______, 1988a:
United Plates of America, the Birth of A Craton: Early Proterozoic Assembly and Growth of Laurentia; Annual Review of Earth and Planetary Science, v. 16, p. 543-604.

______, 1988b:
Geology and tectonics, east arm of Great Slave Lake, Northwest Territories; Geological Survey of Canada, Map 1628A.

Hoffman, P.F., Dewey, J.F., and Burke, K., 1974:
Aulacogens and their genetic relation to geosynclines, with a Proterozoic example from Great Slave Lake, Canada; *in* Modern and Ancient Geosynclinal Sedimentation, ed. R.J. Dott Jr., and R.H. Shover; Society of Economic Paleontologists and Mineralogists, Special Publication no. 19, p. 38-55.

Hoffman, P.R., Bell, I.R., Hildebrand, R.S. and Thorstad, L. 1977:
Geology of the Athapuscow Aulacogen, East Arm of Great Slave Lake, District of Mackenzie; *in* Report of Activities, Geological Survey of Canada, Paper 77-1A, p. 117-129.

Krebs, W. and Macqueen, R., 1984:
Sequence of diagenetic and mineralization events, Pine Point lead-zinc property, NWT; Bulletin, Canadian Society of Petroleum Geologists v. 32, no. 4, p. 434-464.

Lajoie, J.J. and Klein, J., 1979:
Geophysical exploration at the Pine Point Mines Ltd., zinc-lead property, NWT, Canada; *in* Geophysics and Geochemistry in The Search for Metallic Ores; ed. P.J. Hood; Geological Survey of Canada, Economic Geology Report 31, p. 653-664.

Lord, C.S., 1951:
Mineral industry of District of Mackenzie, NWT; Geological Survey of Canada, Memoir 261, 336 p.

______, 1953:
Geological Notes on Southern District of Keewatin, NWT; Geological Survey of Canada, Paper 53-22, 11 p.

Mason, J.D., 1969:
Nickel-cobalt-bismuth deposit on Blanchet Island, Great Slave Lake, Western Miner, v. 42, no. 5, p. 22-23.

Metcalfe, K.G., 1987:
Ennadai Project, Saskatchewan, 1987; Mineral Prospecting Permits 1143 and 1154, East West Resources summary report, Saskatchewan Energy and Mines.

Murphy, J.D., 1971:
Property report on DEE, LUX claims, NTS 85 H/16; DIAND files.

Norris, A.W., 1965:
Stratigraphy of Middle Devonian and older Paleozoic rocks of the Great Slave Lake regions, NWT; Geological Survey of Canada, Memoir 322, 180 p.

Padgham, T., Caine, T.W., Hughes, D.R., Jefferson, C.W., Kennedy, M.W. and Murphy, J.D., 1978:
Mineral Industry Report. 1969 and 1970, NWT east of 104° West longitude, v. 3; NWT Geology Division, DIAND, EGS 1978-6, 188 p.

Pinckston, D.R. and Smith, D.G.W., 1988:
Mineralogy of the Lake Zone, Thor Lake, NWT; NWT Geology Division, DIAND, EGS 1988-5, 13 p.

Rhodes, D., Lantos, E.A., Lantos, J. A., Webb, J.R. and Owens, D.C., 1984:
Pine Point orebodies and their relationship to the stratigraphy, structure, dolomitization and karstification of the Middle Devonian Barrier Complex; Economic Geology, v. 79, no. 5, p. 991-1055.

Schreiner, B.T., 1984:
Quaternary investigations of the Hatle Lake area, Saskatchewan; unpublished report by the Saskatchewan Research Council for SMDC, SRC Pub. No. R-842-4-3-84 (1984).

Seigel, H.O., Hill, H.L. and Baird, J.G., 1968:
Discovery case history of the Pyramid ore bodies, Pine Point, NWT, Canada; Geophysics, v. 33, p. 645-656.

Skall, H., 1975:
The paleo environment of the Pine Point lead-zinc district; Economic Geology, v. 709, no. 4, p. 22-47.

Smith, D.G.W., 1985:
Mineralogical and economic geology evaluations Thor Lake rare metal deposits; *in* Exploration Overview NWT, 1985, p. 28-29.

Smith, D.G.W., and de St. Jorre, L., 1986:
Mineralogy of the co-product metals in the T-zone beryllium deposits, Thor

Lake, NWT; *in* Contributions to the Geology of the NWT, v. 2, DIAND EGS 1985-6, 33 p.

Taylor, F.C., 1963:
Snowbird Lake Map-area, District of Mackenzie: Geological Survey of Canada, Map 5-1960.

__________, 1963:
Snowbird Lake map-area, District of Mackenzie: Geological Survey of Canada, Memoir 333, 22 p.

Trueman, D.L., 1984:
Beryllium operation at Thor Lake; Northern Miner, Jan. 19, 1984, p. B29.

Trueman, D.L. Pedersen, J.C. and de St. Jorre, L., 1984:
Geology of the Thor Lake beryllium deposits: an update; *in* Contributions Geology of the NWT, v. 1, NWT Geology Division, DIAND, EGS 1984-6, p. 115-120.

Trueman, D.L., de St. Jorre, L., Pederson, J.C., and Smith, D.G.W., 1988:
The Thor Lake rare metal deposits, NWT, Canada; *in* Proceedings of Granite Related Mineral Deposits, ed. R.D. Taylor, CIM Special Volume 39, p. 280-290.

Webb, R.J., 1988:
Localization of Prismatic Orebodies by Stratigraphic/Structural Control, South Trend, Pine Point Lead-Zinc Property, NWT, Canada; M.Sc. thesis, University of Waterloo, 250 p.

Webb, R.J., and Macqueen, R.W., 1985:
Back barrier stratigraphy/structure/orebody controls Presqu'ile Complex, Pine Point lead-zinc NWT; Geological Association of Canada, Abstracts v. 10, p. A67.

CHAPTER 7
BEAR STRUCTURAL PROVINCE

J.B. Seaton
District Geologist, Bear-Slave

INTRODUCTION

The geology of the Bear Structural Province (Fig. 7-1) has been summarized in several previous Mineral Industry Reports (Seaton, 1978, 1981, 1983a, 1984, 1985, 1987; Seaton and Hurdle, 1978). In this report no attempt is made to summarize the geology. Several Geological Survey of Canada and university thesis projects are in progress or have recently been completed covering parts of the Bear Province and it is anticipated that soon a drastically revised geological summary may be required.

The East Arm Subprovince, though geologically included with the Bear Province, is covered in Chapter 6 of this Mineral Industry Report.

References relating to individual property descriptions are listed separately in the appropriate sections. General information on the Bear Structural Province and detailed reports on mapping of specific areas of the Bear Province include those by: Allan and Cameron (1973); Badham (1972, 1976, 1978); Barager and Donaldson (1973); Bowring (1982); Campbell (1978, 1979); Campbell and Cecile (1975, 1976a,b,c, 1979); Cecile and Campbell (1977); Easton (1980); Fraser (1964, 1974); Fraser *et al.* (1972); Gibb (1978); Grasty and Richardson (1972); Grotzinger (1982); Grotzinger and Gall (1986); Grotzinger *et al.* (1987); Henderson, J.F. (1949); Hildebrand (1981, 1982, 1984); Hildebrand *et al.* (1984, 1987); Hildebrand and Roots (1985); Hoffman (1973, 1977, 1978, 1980a,b,c,); Hoffman and Bell (1975); Hoffman and Cecile (1974); Hoffman and Henderson (1972); Hoffman and Bell (1975); Hoffman and McGlynn (1977); Hoffman *et al.* (1970, 1977, 1978, 1980, 1984); Hoffman and Pelletier (1982); Kerans *et al.* (1981); Kidd (1933, 1936); Kindle (1972); King *et al.* (1986, 1987); Lang (1952); Lord (1941, 1942, 1951); Lord and Parsons (1952); Miller (1982); McGlynn (1957, 1971, 1974, 1975, 1976, 1977, 1980); McGlynn and Ross (1963); McGrath and Hildebrand (1984); Mursky (1963, 1973); Padgham *et al.* (1974); Reichenbach (1985); Shegelski and Murphy (1972); Shegelski and Thorpe (1972); Smith (1962, 1967); St-Onge and Hoffman (1980); St-Onge *et al.* (1984); Thompson and Ashton (1984); Thorpe (1970); Tirrul (1985); Tremblay (1971); Wilson and Lord (1942). This list is largely restricted to Geological Survey of Canada publications.

Two of the three properties reported below are underlain by rocks of the Helikian Muskox Intrusion or its Epworth or Akaitcho Group Aphebian wallrocks. One property is underlain by rocks of the McTavish Supergroup or plutonic rocks of the Great Bear Volcano-Plutonic Complex.

PROSPECTING PERMITS 1098, 1099

Central Electricity Generating	Uranium, Copper
Board Exploration (Canada) Ltd.	86 F/4
Suite 700, 635 8th Ave. SW	65°00-65°15'N
Calgary, Alta., T2P 3M3	117°30'-117°45'W

REFERENCES

Lord and Parsons (1952); Hildebrand and Roots (1985); Pelletier (1985); Reichenbach (1985).

DIAND assessment reports: 018860, 082150, 082733.

PROPERTY

Prospecting Permits 1098, 1099.

LOCATION

The permit areas are from 330 km to 355 km northwesterly of Yellowknife. Prospecting Permit 1098 covers 86 F/4 NE and includes part of Longtom Lake, and Prospecting Permit 1099 covers 86 F/4 SE and includes part of Zebulon Lake.

HISTORY

Previous work documented as assessment is limited to one incomplete report by Bel Can Explorations in 1968. The report, unfinished because of the author's death, refers to an airborne radiometric survey, results of which are not available.

Prospecting Permits 1098 and 1099 were granted to Central Electricity Generating Board Exploration Canada Ltd. (CEGBE) in February 1986 following reconnaissance, 1:1000 geological mapping, and prospecting in 1985, which resulted in the discovery of three uranium showings: the Damp, Maia and DW showings in the Longtom Lake area.

DESCRIPTION

Lord and Parsons (1952) mapped 86 F at 1:253 440; Lord mapped the Longtom Lake-Zebulon Lake area. Though more recent mapping has been conducted east of longitude 117°27'W (Pelletier, 1985) and west of 118°W (Hildebrand, 1985; Reichenbach, 1985), the intervening ground which includes Prospecting Permits 1098 and 1099 has not been remapped by the Geological Survey of Canada or DIAND-sponsored crews.

The permit areas are underlain mainly by granitoid rocks that commonly intrude andesitic volcanics, sediments and quartz-feldspar porphyries of extrusive and intrusive origin.

At the Damp uranium showing at Longtom Lake, a roof pendant of volcanics forms a synclinal structure flanked by quartz-monzonite.

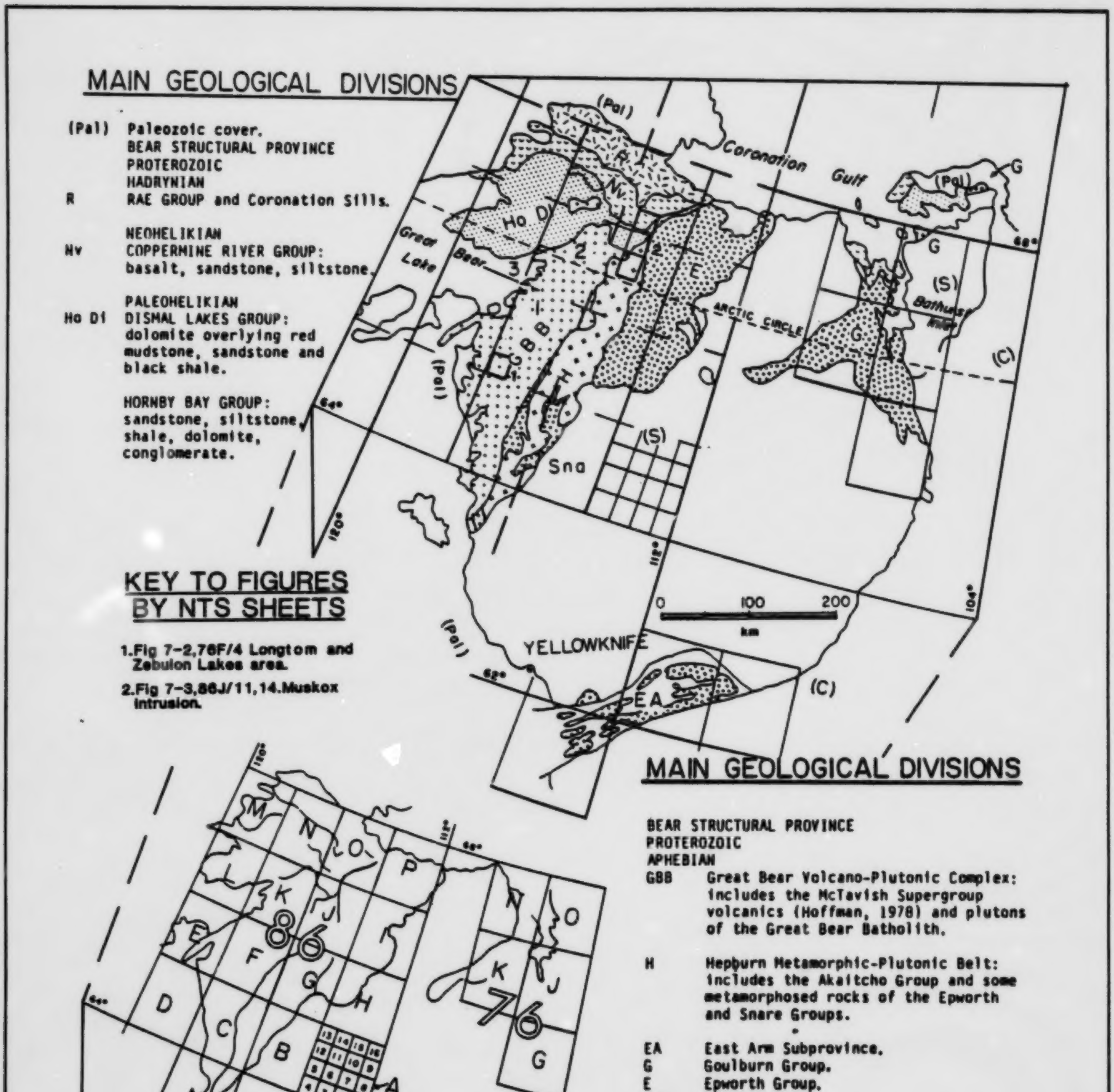

MAIN GEOLOGICAL DIVISIONS
(Pal) Paleozoic cover.
BEAR STRUCTURAL PROVINCE
PROTEROZOIC
HADRYNIAN
R RAE GROUP and Coronation Sills.
NEOHELIKIAN
Nv COPPERMINE RIVER GROUP: basalt, sandstone, siltstone.
PALEOHELIKIAN
Ho Dl DISMAL LAKES GROUP: dolomite overlying red mudstone, sandstone and black shale.
HORNBY BAY GROUP: sandstone, siltstone, shale, dolomite, conglomerate.
KEY TO FIGURES BY NTS SHEETS
1.Fig 7-2,76F/4 Longtom and Zebulon Lakes area.
2.Fig 7-3,86J/11,14.Muskox intrusion.
MAIN GEOLOGICAL DIVISIONS
BEAR STRUCTURAL PROVINCE
PROTEROZOIC
APHEBIAN
GBB Great Bear Volcano-Plutonic Complex: includes the McTavish Supergroup volcanics (Hoffman, 1978) and plutons of the Great Bear Batholith.
H Hepburn Metamorphic-Plutonic Belt: includes the Akaitcho Group and some metamorphosed rocks of the Epworth and Snare Groups.
EA East Arm Subprovince.
G Goulburn Group.
E Epworth Group.
Sna Snare Group.
Note: East Arm Subprovince is reported in Chapter 6.
(C) CHURCHILL STRUCTURAL PROVINCE, PROTEROZOIC AND ARCHEAN.
(S) SLAVE STRUCTURAL PROVINCE, ARCHEAN.
(Pal)
Coronation Gulf
R
Nv
Ho Dl
Great Bear Lake
1
2
3
E
G
(S)
Bathurst Inlet
ARCTIC CIRCLE
(C)
GBB
H
Sna
68°
64°
120°
112°
104°
62°
0 100 200
km
YELLOWKNIFE
EA
N.T.S. KEY
M N O P
L K J
E F G H
D C B A
M
86
N O
K J
76
G
K
85
H L K
75

FIGURE 7-1: Geological subdivisions of the Bear Structural Province and locations of Figures 7-2 and 7-3.

CURRENT WORK AND RESULTS

In 1986 aeromagnetic anomaly target areas Z-1, Z-2 and Z-3 (Fig. 7-2) were prospected and geologically mapped at 1:10 000, 1:9200 and 1:15 000 respectively, and detailed surveys conducted at the Z-1 area, at and around the Damp and DW/Fog showings, where four grids were constructed: the Damp, DW/Fog, Seahorse and Seahorse-East grids (Fig. 7-2).

On the Damp grid work included: 1:1000 geological mapping, total field magnetometer vertical magnetic gradient, VLF EM, radiometric surveys, and soil sampling. A total of 248 soil samples collected from the Damp and DW/Fog grids were analysed for uranium, copper and silver. The Damp prospect was tested by ten trenches which were sampled and geologically mapped at 1:100 scale.

The Seahorse, Seahorse East and DW/Fog grids were explored by 1:1000 geological mapping, total field magnetometer vertical magnetic gradient and VLF EM surveys. Soil sampling was done on the DW/Fog Grid.

Encouraging results were obtained from the Damp prospect, a brecciated zone within a unit described as a rhyodacitic ashflow tuff. This breccia zone, which is strongly radioactive, is heavily albitised and veined by magnetite and hematite. Copper sulphides were found disseminated in albitised rock fragments and in veins. Botryoidal pitchblende was found in hematite-rich parts of the veins. Anomalous local concentrations of silver, zinc, cobalt, vanadium and lead are reported. The Damp prospect was outlined over a strike length of 300 m and an average width of 10-15 m. Results of VLF EM and soil sampling suggest that the Damp prospect may extend an additional 100 m southeasterly under overburden to Grouper Pond (Fig. 7-2). Best result from chip sampling was 0.95% U_3O_8 and 0.39% Cu across 6 m.

A linear west-northwesterly trending magnetic low was delineated in the southeastern part of the DW/Fog Grid and may be caused by a zone of albitisation and hematization of andesite beneath surficial deposits.

In 1987 an unsuccessful attempt was made to trench through overburden near Grouper Pond to test a VLF EM conductor. Alteration patterns, particularly sericitization at the eastern end of the Damp showing, were investigated.

Drilling subsequent to 1987 has revealed that encouraging surface concentrations of uranium do not persist in depth.

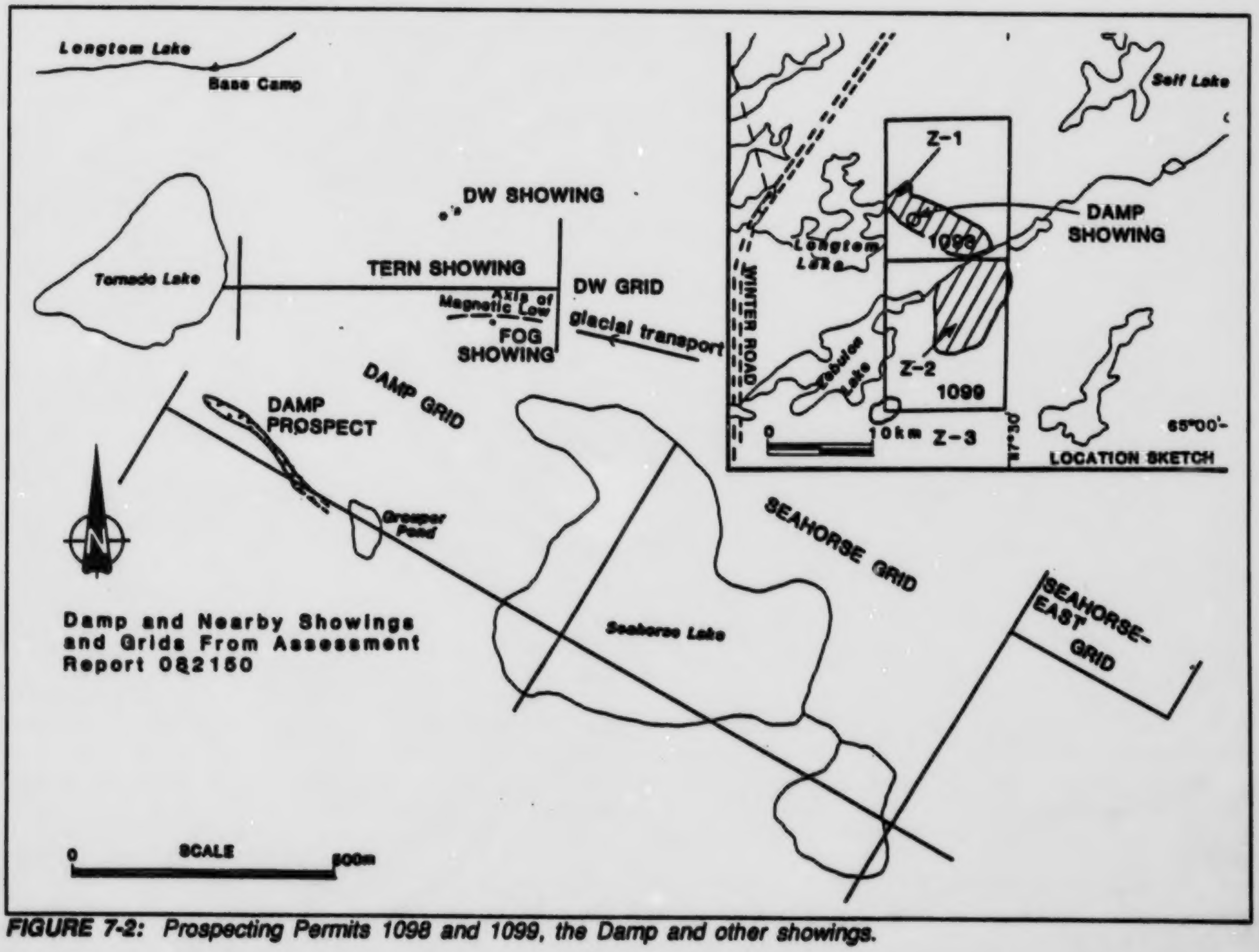

Longtom Lake
Base Camp
DW SHOWING
TERN SHOWING
Tornado Lake
DW GRID
Axis of Magnetic Low
FOG SHOWING
glacial transport
DAMP GRID
DAMP PROSPECT
Grouper Pond
N
SEAHORSE GRID
Seahorse Lake
SEAHORSE-EAST GRID
Damp and Nearby Showings and Grids From Assessment Report 082150
0
SCALE
500m
Self Lake
Z-1
DAMP SHOWING
Longtom Lake
1098
WINTER ROAD
Zebulon Lake
Z-2
1099
0
10km
Z-3
67°30'
65°00'
LOCATION SKETCH

FIGURE 7-2: Prospecting Permits 1098 and 1099, the Damp and other showings.

MUSKOX PROPERTY

Equinox Resources Ltd.
500 576 Seymour St.
Vancouver, B.C., V6B 2K1

Platinum Group Metals
Copper, Nickel
86 J/11,14; 86 O/3
66°42'-67°11'N
115°06'-115°28'W

REFERENCES

Baragar and Donaldson (1973); Craig (1960); Craig *et al.* (1960); Findlay and Smith (1965); Hoffman (1980b, 1984); Irvine (1970, 1971); Sasaki (1969); Seaton (1984); Smith (1962, 1967).

DIAND assessment reports: 019171, 060469, 060470, 060471, 080765, 082562, 082563.

PROPERTY

Equinox Resources Ltd. claims: REEF 1-4; SPEE 4-13; REEF 1-4; RIM; VAL 1-7; YOKE 1-9.

Claims optioned to Equinox Resources Ltd. by B.P. Minerals Canada and others: B 1-3; U 7, 59.

LOCATION

The property lies from 475 km to 520 km north-northeasterly of Yellowknife and comprises two blocks of claims. The VAL and RIM claims form one block that extends from the Coppermine River to McGregor Lake. The other block, comprising the REEF, SPEE and YOKE claims, extends northwards from the vicinity of Speers Lake to west of Drill Lake. The two claim blocks are separated by International Platinum Corporation's OX 16-25 claims (Fig. 7-3).

HISTORY

The history of discovery, mapping, exploration and drilling of the Muskox Intrusion has been summarised under "OX claims" (p. 125 of this report).

The SPEE and VAL claims were recorded by Equinox Resources Ltd. in April 1986, the REEF and RIM in August 1986 and the YOKE claims in September 1986.

B 1-3 were recorded in April 1979 by B.P. Minerals Ltd. U 7 and U 59 were recorded by Union Carbide Canada Ltd. in April and October 1979 respectively. B.P. Minerals and Union Carbide Canada were partners in the Hornby Bay Project which explored the B, U and other claims for uranium (Seaton, 1984).

DESCRIPTION

The central layered complex and marginal phases, exclusive of the feeder dyke, is exposed for more than 50 km northward from the Coppermine River. The feeder dyke has been traced roughly 55 km south-southeasterly from the Coppermine River. The bulk of the intrusion is a gently northerly inclined layered ultramafic-mafic complex capped by granophyric rocks. The feeder dyke is mainly bronzite gabbro with minor amounts of olivine-rich rock. The complex has been eroded to progressively deeper levels southwards.

Marginal rocks of the Muskox Intrusion include olivine-rich units and a thin unit of bronzite gabbro near the contact. These units dip inward towards the axis of the intrusion, at about 30° (Smith *et al.*, 1967).

The geology of the Muskox Intrusion is described in more detail under the "OX claims" section (p. 125 of this report).

CURRENT WORK AND RESULTS

In 1986 work started in early August and comprised prospecting, rock, soil and silt sampling, diamond drilling and geophysical surveying.

Work commenced on the SPEE claims where the Muskox Reef (a thin chromite layer with which sulphide-rich layers are associated) was prospected and traced across the property. Prospecting was extended throughout the SPEE claims and another sulphide zone was discovered. A grid was constructed over this zone and explored by soil sampling (Fig. 7-3).

On the VAL claims roughly 15 km of the margins on each side of the intrusion were prospected, with a sampling interval of several hundred metres. In addition, where gossans cap massive sulphides at intervals along the margins, detailed sampling was done. Several of these areas were drilled by the Canadian Nickel Company in 1959 and 1960. Soil sampling as follow-up to this work was done concurrently with geophysical surveys in the fall following diamond drilling.

During 1986, 489 rock samples, 184 soil samples and 16 silt samples were collected. All samples were analysed for platinum and palladium and most for gold, and by 30 element I.C.P. analysis (Mo, Cu, PG, Zn, Ag, Ni, Co, Mn, Fe, As, U, Au, Th, Sr, Cd, Sb, Bi, V, Ca, P, La, Cr, Mg, Ba, Tl, B, Al, Na, K, W). Highly anomalous samples were checked by neutron activation analysis for gold, platinum, palladium, rhodium, ruthenium, iridium and osmium.

A diamond drill program commenced in late August, 1986. Seven holes totalling 1159 m were drilled. The longest hole was 280 m. One hole was abandoned at a depth of 170 m when the rods froze in the hole.

The holes were all drilled on the SPEE claim group (Fig. 7-3) and holes 86-1 to 86-4 were sited so as to explore the Muskox Reef and underlying chromitite, or chromite- and/or sulphide-bearing seams in the upper layered series of gabbro, pyroxenite and feldspathic peridotite. Thin chromite seams are commonly found hosted by websterite near its contact with feldspathic peridotite or gabbro which less commonly hosts chromite-rich seams.

Holes 86-1 to 86-4 intersected the Muskox Reef as intended. Anomalous concentrations of platinum and palladium were found to be hosted by serpentinized peridotite with interstitial chalcopyrite (Hole 86-3), feldspathic peridotite (Hole 86-1), serpentinite that hosts a 1 cm wide chromite seam (Hole 86-5), serpentinized feldspathic peridotite, troctolitic peridotite, serpentinized dunite and olivine gabbro (Hole 86-6) and chalcopyrite-bearing serpentinized peridotite (Hole 86-7). The highest assays were from Hole 86-3 where 3 m of core assayed 317 ppb Pt and 801 ppb Pd.

After demobilisation of the summer program, a fall program was commenced, prompted by encouraging platinum group metal assays from rock samples taken at the end of the summer. A camp was not re-established on the property, but personnel commuted from Coppermine by helicopter. Snow and bad weather hampered the fall program.

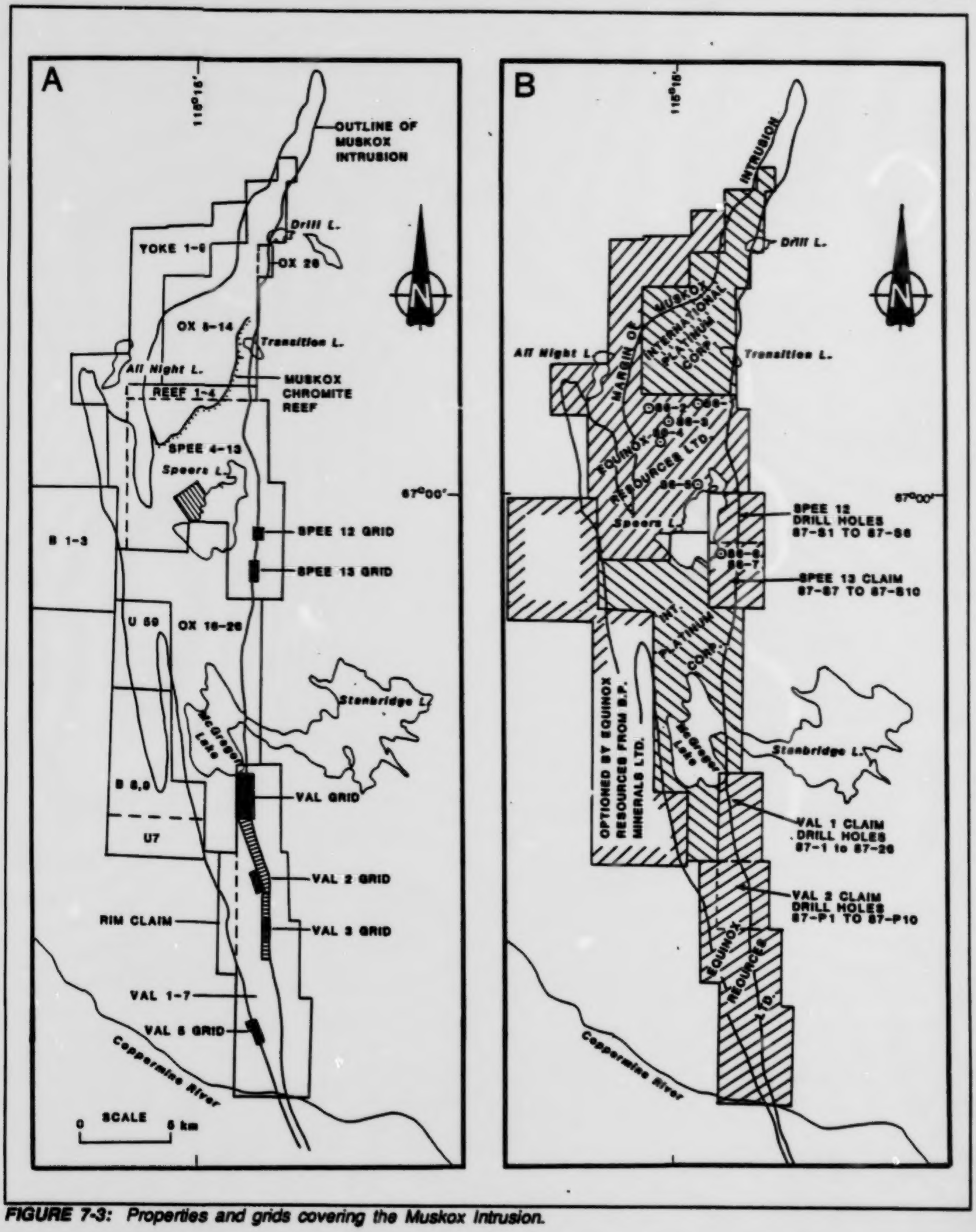

A
115°15'
OUTLINE OF MUSKOX INTRUSION
Drill L.
YOKE 1-6
OX 26
OX 8-14
Transition L.
All Night L.
MUSKOX CHROMITE REEF
REEF 1-4
SPEE 4-13
Speers L.
67°00'
B 1-3
SPEE 12 GRID
SPEE 13 GRID
U 59
OX 16-26
Stanbridge L.
McGregor Lake
B 8,9
VAL GRID
U7
VAL 2 GRID
RIM CLAIM
VAL 3 GRID
VAL 1-7
VAL 5 GRID
Coppermine River
0 SCALE 5 km
B
115°15'
INTRUSION
Drill L.
MARGIN OF MUSKOX
INTERNATIONAL PLATINUM CORP.
All Night L.
Transition L.
86-2
86-
86-3
86-4
EQUINOX RESOURCES LTD.
86-5
67°00'
SPEE 12 DRILL HOLES 87-S1 TO 87-S6
Speers L.
86-6
86-7
SPEE 13 CLAIM 87-S7 TO 87-S10
INT. PLATINUM CORP.
OPTIONED BY EQUINOX RESOURCES FROM B.P. MINERALS LTD.
McGregor Lake
Stanbridge L.
VAL 1 CLAIM DRILL HOLES 87-1 to 87-26
VAL 2 CLAIM DRILL HOLES 87-P1 TO 87-P10
EQUINOX RESOURCES LTD.
Coppermine River

FIGURE 7-3: Properties and grids covering the Muskox Intrusion.

The fall program was designed to evaluate geologically and geochemically areas with anomalous platinum and palladium contents; to test the efficacy of soil sampling as an exploration tool at these sites; to outline massive sulphide zones near surface along the eastern margin of the Muskox Intrusion using a Geonics EM-38 soil inductivity instrument and a magnetometer, complemented by soil sampling to test for associated platinum group metals; and lastly to explore for deeper conductors along the lower contact of the Muskox Intrusion near its eastern margin using VLF EM (Fig. 7-3).

Soil sampling and stream sediment sampling proved generally ineffective in areas underlain by the central layered sequence of the Muskox Intrusion. Soil sampling of the gossanous soils at the intrusion margins however reflected results from rock sampling, though palladium was enhanced relative to platinum in soils, compared with the higher Pt:Pd ratios of rock samples from the same site.

Several VLF EM anomalies sub-parallel to the eastern margin of the Muskox Intrusion were delineated on a grid extending 10 km south of McGregor Lake (Fig. 7-3). The EM-38 survey outlined several strongly conductive zones along the eastern margins of the intrusion but gave no response over most known sulphide-mineralised zones. Magnetometer surveys were curtailed due to instrument malfunction.

Though surface samples from the vicinity of the Muskox Reef were locally highly anomalous, up to 1449 ppb Pt and 2054 ppb Pd 1.2% copper and 0.5% nickel, and samples from drill core assayed up to 152 ppb Pt, 444 ppb Pd across 0.75 m, the highest assays were obtained from massive sulphide zones at the lower contact of the Muskox Intrusion near its eastern margin. A strong positive correlation between the concentration of chalcopyrite and platinum group metals was noted. A 1 m intersection of peridotite with intercumulate chalcopyrite below the Muskox Reef assayed 381 ppb Pt and 669 ppb Pd, and much higher assays from the marginal sulphide zones show a similar association of platinum, palladium, copper and also gold.

In June 1987 a camp was established on the southwestern shore of McGregor Lake. Work was focused on the margins of the Muskox Intrusion and comprised prospecting, rock and soil sampling, geophysical surveys (EM-34, MaxMin II EM, magnetometer and IP), trenching and diamond drilling. During the last two weeks a second drill was brought to the property.

Six grids were constructed (Fig. 7-3) and explored as shown in Table 7-1. In addition to grid surveys, the VAL and RIM claims were explored by regional prospecting of the entire intrusion contact between the Coppermine River and McGregor Lake with the main objective of finding platinum group metal concentrations similar to those found on the grids. Work included rock and frost boil sampling and additional soil sampling of geochemical anomalies.

Diamond drilling comprised: 213 m in 6 holes on Spee 12 grid; 475 m in 4 holes on Spee 13 grid; 1022 m in 26 holes on Val 1 grid; 1498 m in 10 holes on Val 2 grid. Drill targets included selected conductors delineated by horizontal loop EM on the Spee 12, Val 1 and Val 2 grids.

Highly anomalous concentrations of silver are locally present as for example in drill core from the Val 2 grid where 3.34 m of core from hole 87.P5 averages 78.40 ppm Ag. In this case the silver is accompanied by highly anomalous concentrations of copper, nickel, platinum, palladium and gold. On the Val 3 grid however the only anomalous rock sample assay from numerous samples of massive pyrrhotite collected was for silver (40.9 ppm) alone.

On the Val 5 grid highly anomalous silver concentrations in rock samples locally accompany anomalous platinum, palladium, several percent copper and up to 0.5% Ni.

Though exploration of the Muskox Intrusion has shown local spectacular concentrations of platinum group and other metals in rock samples and drill core (Table 7-2), as yet substantial tonnages have not been found. The possibility for such tonnages has by no means been eliminated, and deep penetration EM techniques will likely be used to probe more deeply the footwall of the Muskox Intrusion.

TABLE 7-1: MUSKOX PROJECT - WORK PERFORMED IN 1987, BY GRID AND CLAIM AREA

Grid/Area CLAIMS	SPEE 12	SPEE 13	VAL 1	VAL 2	VAL 3	VAL 5	SOUTHERN VAL
Geological Mapping 1:2500	X	X	X	X	X	X	
Rock Sampling	X	X	X	X	X	X	X
Soil Sampling	X	X	X	X	X	X	X
Apparent Conductivity (EM-34-3)		X	X	X	X	X	
Magnetometer	X		X	X			
HLEM (Maxmin II)	X	X	X	X			
IP (App. Resistivity)			X				
IP (App. Chargeability)			X				
Trenching	1 trench		2 trenches				
Mapping 1:50 and			X				
Trench Sampling			X				
Diamond Drilling	6 holes	4 holes	26 holes	10 holes			

TABLE 7-2: ASSAY RANGES FOR ANOMALOUS ROCK AND DRILL CORE SAMPLES

	ROCK SAMPLES			DRILL CORE	
Grid	Number of Samples	Element	Range	Number of Samples	Range
SPEE 12	9	Pt ppb	380- 2,035		No anomalous intersections
		Pd ppb	2,113-11,960		
		Au ppm	<2-2		
		Cu %	0.89-10.0		
		Ni %	0.06- 1.19		
SPEE 13	5	Pt ppb	228- 2,550	2	1,944/0.70m- 5,572/0.40m
		Pd ppb	125- 5,480		38,450/0.70m-52,920/0.40m
		Au ppm	<2-5		5/0.40m- 6/0.70m
		Cu %	0.45- 3.50		0.22/0.40m- 1.18/0.70m
		Ni %	0.06- 0.38		3.79/0.40m- 3.88/0.70m
VAL 1	13	Pt ppb	87- 5,583	8	94/1.53m- 962/1.27m
		Pd ppb	1,720-39,429		618/1.59m- 4,950/1.59m
		Au ppm	<2		<2
		Cu %	0.30- 8.68		0.40/1.53m- 6.03/0.67m
		Ni %			0.13/1.59m- 1.77/1.67m
VAL 2		Pt ppb	All <1000 ppb	9	52/0.70m- 2,228/1.71m
		Pd ppb	combined Pt and Pd		1,118/0.66m-16,044/1.71m
		Au ppm	<2		<2
		Cu %	- 7.45max.		0.67/0.66m- 22.90/1.71m
		Ni %	- 2.10max.		0.26/1.88m- 8.15/1.71m

OX CLAIMS

International Platinum Corporation
2304 Sun Life Tower
Box 30, 150 King St. W
Toronto, Ont., M5H 1J9

Platinum Group
Metals, Copper, Nickel
86 J/14; 86 O/3
66°49'-67°11'N
115°08'-115°21'W

REFERENCES

Baragar and Donaldson (1973); Craig (1960); Craig *et al.* (1960); Findlay and Smith (1965); Hoffman (1980b, 1984); Irvine (1970, 1971); Sasaki (1969); Smith (1962, 1967).

DIAND assessment reports: 019171, 060469, 060470, 060471, 080765, 082562, 082563, 082590.

PROPERTY

OX 8-14, 16-26.

LOCATION

The area, which comprises two discrete blocks of claims (Fig. 7-3) is centred at Speers Lake, roughly 505 km north-northwesterly of Yellowknife.

HISTORY

H. Vuori of Canadian Nickel Company Ltd. (a subsidiary of the International Nickel Company of Canada Ltd., which in 1976 became Inco Ltd.) discovered the Muskox Intrusion in 1956.

The Muskox Intrusion was mapped by C.H. Smith of the Geological Survey of Canada in 1959 and 1960 (Smith, 1962). The surrounding area was mapped on a reconnaissance scale of 1:506 880 by Craig and others in 1959 (Craig *et al.*, 1960). Craig (1960) also mapped the surficial geology of the mainland from 65°N to 70°N and 112°W to 124°W. Mapping by Smith was revised by Smith, Irvine and Findlay in 1963, and the resultant maps 1213A and 1213B were published at a scale of 1:63 660 in 1967 (Smith, 1967).

Since its discovery the Muskox Intrusion has attracted much attention to its copper, nickel and platinum group metals potential. Canadian Nickel Company staked virtually the whole of the intrusion and drilled numerous holes (65 are plotted on Map 1213A) mostly along the gossanous margins of the Muskox Intrusion, from 1957 to 1959 (GSC Map 1213A). Regrettably no record of most of this work is publicly available. Evidently almost no assessment work was submitted or has survived. Only one report (DIAND assessment report 080765) comprising four drill hole logs has been found.

In 1963 the Muskox Drilling Project (Canadian Contribution to the International Upper Mantle Project No. 40) commenced. Three diamond drill holes, totalling 3075 m, the deepest of which reached 1220 m, were completed at and north of Speers Lake (Findlay and Smith, 1965). The Muskox Drilling Project concentrated on the axial layered part of the intrusion (GSC Map 1213A).

By the late 1960's most of Canadian Nickel Company's claims had lapsed.

In 1969 and 1970 Trans-Canada Resources Ltd. flew a helicopter-borne EM and magnetometer survey over areas west and south of McGregor Lake, and geologically mapped parts of the eastern and western margins of the Muskox Intrusion on their TOC and OXO claim groups (DIAND assessment reports: 060469, 060470, 060471, 019171).

In 1977 BP Minerals Ltd. and Union Carbide, while exploring for uranium on extensive claim blocks to the immediate west of the Muskox Intrusion, briefly prospected the chromite reef which outcrops sparingly north of Speers Lake.

After 1977 little or no exploration was done on the Muskox Intrusion until an upsurge in the price of platinum attracted exploration interest to the Muskox Intrusion in 1986, when International Platinum Corporation (then Silver Lake Resources Inc.) and Equinox Resources Ltd. each staked large areas.

International Platinum Corporation's property comprises: OX 8-14, recorded in June 1986; OX 16-25, recorded in April 1986; and OX 26, recorded in August 1986. OX 26 with OX 8-14 constitute the northern block of claims; OX 16-25 are 7 km to the south. Ground between the two blocks was staked by Equinox Resources in 1986.

DESCRIPTION

The layered and keeled Muskox Intrusion comprises olivine-rich units, pyroxenitic units, gabbroic units and granophyric units (Smith, 1967). A chromitite layer 20-40 cm thick is present in the upper part of the complex roughly 4.5 m above the base of a pyroxenite layer (Smith, 1962). Several copper-nickel showings have been mapped in wall rocks within 100 m of the margin of the Muskox Intrusion (Smith, 1967). Most of the showings are coincident with conspicuous gossans that in some cases cap massive pyrrhotite only. The copper-nickel showings have been tested by drill holes collared in the intrusion so as to test marginal olivine-rich units and gabbroic units which slope inward towards the axis of the intrusion, and the footwall rocks. Relatively little attention was paid to the layered and more gently inclined rocks which form the bulk of the intrusion, and give rise to the recessive topography in part occupied by McGregor and Speers lakes. Much of this area of recessive topography is underlain by serpentinized dunite which, in the rare cases it outcrops, is friable weathered brown rubbly material.

The Muskox Intrusion intruded into rocks of widely different ages ranging from allochthonous Archean basement, through Aphebian rocks of the Coronation Supergroup (Akaitcho Group, Epworth Group and Recluse Group) and Hepburn Intrusive Suite to rocks of the Helikian Hornby Bay and probably the Dismal Lakes Groups. Hoffman (1980) suggested that the Muskox Intrusion is coeval with and even comagmatic with the Coppermine River basalts, basing his arguments on the nature of movements on two branches of the Canoe Lake Fault which displaces the Muskox Intrusion.

CURRENT WORK AND RESULTS

In 1986 both the northern (OX 8-14, 26) or Transition Lake and the southern (McGregor Lake) claim blocks were explored by 1:20 000 geological mapping, lithogeochemical surveys and soil sampling. Selected rocks were submitted to Vancouver Petrographics Ltd. for petrological examinations.

A total of 285 rock samples were collected. All of these were analysed for nickel, copper, platinum and palladium and 219 were also analysed for chromium.

Soil sampling was done concurrently with geological traversing. The 449 soil samples collected were analysed for copper, nickel, platinum, palladium and chromium.

Rock samples anomalous in platinum and palladium (Pt + Pd > 100 ppb) were obtained from several localities, mostly near the margins of the Muskox Intrusion as were anomalous soils (Pt + Pd > 50 ppb), but in only two cases in 22 sampling traverses were rock and soil anomalies coincident or closely spatially related.

International Platinum Corporation's program is directed to the exploration of three types of platinum group metals targets:

1. Hydrothermal deposits along faults cutting the Muskox Intrusion;
2. Deposits along the margins of the intrusion commonly associated with copper, nickel and iron sulphides and probably related genetically to steep temperature gradients at the margins of the intrusion and to contamination by and reducing effects of graphitic wall rock sediments of the Akaitcho and Epworth Groups;
3. Sulphidic layers enriched in platinum group metals within the 'core' of the Muskox Intrusion.

REFERENCES

Allan, R.J. and Cameron, E.M., 1973:
Uranium, zinc, lead, manganese, iron, organic matter, copper, nickel and potassium content of lake sediments, Bear-Slave Operation, District of Mackenzie; Geological Survey of Canada, maps 9 - 1972 to 15 - 1972.

Badham, J.P.N., 1972:
The Camsell River-Conjuror Bay area, Great Bear Lake, NWT; Canadian Journal of Earth Science, v. 9, no. 11, p. 1460-1468.

________, 1976:
Orogenesis and metallogenesis with reference to the silver-nickel, cobalt arsenide ore association; *in* Metallogeny and Plate Tectonics, ed. D.F. Strong; Geological Association of Canada, Special Paper 14, p. 559-571.

________, 1978:
The early history and tectonic significance of the East Arm graben, Great Slave Lake, Canada; Tectono-physics, v. 45, p. 201-215.

Barager, W.R.A. and Donaldson, J.A., 1973:
Coppermine and Dismal Lakes map-area; Geological Survey of Canada, Paper 71-39, 20 p.

Bowring, S.A., 1982:
Preliminary geology of Kamut and Adams Lake area, North-Central Wopmay Orogen, District of Mackenzie, NWT, NTS 85 K/8, 9; NWT Geology Division, DIAND, EGS 1982-1.

Campbell, F.H.A., 1978:
Geology of the Helikian rocks of the Bathurst Inlet area, Coronation Gulf, NWT; *in* Current Research, Part A; Geological Survey of Canada, Paper 78-1A, p. 97-106.

________, 1979:
Stratigraphy and sedimentation in the Helikian Elu Basin and Kiukitak Platform, Bathurst Inlet - Melville Sound, NWT; Geological Survey of Canada, Paper 79-8, 18 p.

Campbell, F.H.A. and Cecile, M.P., 1975:
Report on the geology of the Kilohigok Basin, Goulburn Group, Bathurst Inlet, NWT; *in* Report of Activities, April to October, 1974; Geological Survey of Canada, Paper 75-1A, p. 297-306.

________, 1976a:
Geology of the Kilohigok Basin, Goulburn Group, Bathurst Inlet, District of Mackenzie; *in* Report of Activities, Part A; Geological Survey of Canada, Paper 76-1A, p. 369-377.

________, 1976b:
Geology of the Kilohigok Basin, Bathurst Inlet, NWT; Geological Survey of Canada, Open File 332.

________, 1976c:
Tectono-depositional relationships between the Aphebian Kilohigok Basin and the Coronation Geosyncline, NWT; Geological Association of Canada, Program and Abstracts, v. 1, p. 63.

________, 1979:
The northeastern margin of the Aphebian Kilohigok Basin, Melville Sound, Victoria Island, District of Franklin; *in* Current Research, Part A; Geological Survey of Canada, Paper 79-1A, p. 91-94.

Cecile, M.P. and Campbell, F.H.A., 1977:
Large-scale stratiform and intrusive sedimentary breccias of the lower Proterozoic Goulburn Group, Bathurst Inlet, NWT; Canadian Journal of Earth Science, v. 14, no. 10, p. 2364-2387.

Craig, B.G., 1960:
Surficial geology of north-central District of Mackenzie, Northwest Territories; Geological Survey of Canada, Paper 60-18, 8 p.

Craig, B.G., Davison, W.L., Fraser, J.A., Fulton, R.J., Heywood, W.W., and Irvine, T.N., 1960:
Geology of north-central District of Mackenzie; Geological Survey of Canada, map 18-1960.

Easton, R.M., 1980:
Stratigraphy and geochemistry of the Akaitcho Group, Hepburn Lake map area, District of Mackenzie: an initial rift succession in Wopmay Orogen (early Proterozoic); *in* Current Research, Part B; Geological Survey of Canada, Paper 80-1B, p. 47-57.

Findlay, D.C., and Smith, C.H., 1965:
The Muskox Project; Geological Survey of Canada, Paper 64-44, 170 p.

Fraser, J.A., 1964:
Geological notes on northeastern District of Mackenzie, NWT; Geological Survey of Canada, Paper 63-40, 20 p.

________, 1974:
The Epworth Group Rocknest Lake area, District of Mackenzie; Geological Survey of Canada, Paper 73-39, 23 p.

Fraser, J.A., Hoffman, P.F., Irvine, T.N. and Mursky, G., 1972:
The Bear Province; *in* Variations in Tectonic Styles in Canada, eds. R.A. Price and R.J.W. Douglas; Geological Association of Canada, 25th Anniversary Volume, Special Paper 11, p. 453-503.

Gibb, R.A., 1978:
Slave-Churchill collision tectonics; Nature, v. 271, no. 5640, p. 50-52.

Grasty, R.L. and Richardson, K.A., 1972:
Seven radioactivity maps (1:250 000) and profiles of 67 flight lines (1:500 000) of a gamma-ray spectrometer survey of an area north of Great Slave Lake and the islands of the East Arm of Great Slave Lake, NWT; Geological Survey of Canada, Open File 124.

Grotzinger, J.P., 1982:
A preliminary account of the internal stratigraphy of the Rocknest Formation, foreland thrust-fold belt of Wopmay Orogen, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 82-1A, p. 117-118.

Grotzinger, J.P. and Gall, Q., 1986:
Preliminary investigations of early Proterozoic Western River and Burnside River formations: evidence for foredeep origin of Kilohigok Basin, District of Mackenzie; *in* Current Research, Part A, Geological Survey of Canada, Paper 86-1A, p. 95-106.

Henderson, J.F., 1949:
Pitchblende occurrences between Beaverlodge and Hottah Lake, NWT; Geological Survey of Canada, Paper 49-16, 17 p.

Hildebrand, R.S., 1981:
Early Proterozoic LaBine Group of Wopmay Orogen: remnant of a continental volcanic arc developed during oblique convergence; *in* Proterozoic Basins of Canada, ed. F.H.A. Campbell; Geological Survey of Canada, Paper 81-10, p. 133-156.

______, 1982:
A continental arc of early Proterozoic age at Great Bear Lake, NWT; unpublished Ph.D. thesis, Memorial University of Newfoundland, St. John's, NFLD, 237 p.

______, 1984:
Geology of the Rainy Lake-White Eagle Falls area, District of Mackenzie: early Proterozoic cauldrons, stratovolcanoes, and subvolcanic plutons; Geological Survey of Canada, Paper 83-20, 42 p.

Hildebrand, R.S., Annesley, I.R., Bardoux, M.V., Davis, W.J., Heon, D., Reichenbach, I.G., and Van Nostrand, T., 1984:
Geology of the early Proterozoic rocks in parts of the Leith Peninsula map area, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 84-1A, p. 217-221.

Hildebrand, R.S. and Roots, C.F., 1985:
Geology of the Riviere Grandin map area (Hottah Terrane and western Great Bear Magmatic Zone), District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 85-1A, p. 373-383.

Hoffman, P.F., 1973:
Evolution of an early Proterozoic continental margin: the Coronation geosyncline and associated aulacogens of the northwestern Canadian Shield; *in* Evolution of the Precambrian Crust, eds. J. Sutton and B.F. Windley; Philosophical Transactions of the Royal Society of London, Series A, v. 273, p. 547-581.

______, 1977:
Preliminary geology of Proterozoic formations in the East Arm of Great Slave Lake, District of Mackenzie; Geological Survey of Canada, Open File 475.

______, 1978:
Geology of the Sloan River map-area (86K), District of Mackenzie, NWT; Geological Survey of Canada, Open File 535.

______, 1980a:
Conjugate transcurrent faults in north-central Wopmay Orogen (early Proterozoic) and their dip-slip reactivation during post-orogenic extension, Hepburn Lake map area, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 80-1A, p. 183-185.

______, 1980b:
On the relative age of the Muskox Intrusion and the Coppermine River basalts, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 80-1A, p. 223-225.

______, 1980c:
Wopmay Orogen: a Wilson cycle of early Proterozoic age in the northwest of the Canadian Shield; *in* The Continental Crust and its Mineral Resources, ed. D.W. Strangway; Geological Association of Canada, Special Paper 20.

______, 1984:
Geology, northern internides of Wopmay Orogen, District of Mackenzie, NWT; Geological Survey of Canada map 1576A.

Hoffman, P.F. and Bell, I., 1975:
Volcanism and plutonism, Sloan River map-area (86K), Great Bear Lake, District of Mackenzie; *in* Report of Activities, April to October, 1974; Geological Survey of Canada, Paper 75-1A, p. 331-337.

Hoffman, P.F., Bell, I.R., Hildebrand, R.S. and Thorstad, L., 1977:
Geology of the Athapuscow Aulacogen, East Arm of Great Slave Lake, District of Mackenzie; *in* Report of Activities, Part A; Geological Survey of Canada, Paper 77-1A, p. 117-129.

Hoffman, P.F., Bell, I.R. and Tirrul, R., 1976:
Sloan River map-area (86K), Great Bear Lake, District of Mackenzie; *in* Report of Activities, Part A; Geological Survey of Canada, Paper 76-1A, p. 353-358.

Hoffman, P.F. and Cecile, M.P., 1974:
Volcanism and plutonism, Sloan River map-area (86K), Great Bear Lake, District of Mackenzie; *in* Report of Activities, Part A, April to October, 1973; Geological Survey of Canada, Paper 74-1A, p. 173-176.

Hoffman, P.F., Fraser, J.A. and McGlynn, J.C., 1970:
The Coronation Geosyncline of Aphebian age, District of Mackenzie; *in* Symposium of Basins and Geosynclines of the Canadian Shield, ed., A.J. Baer; Geological Survey of Canada, Paper 70-40, p. 201-212.

Hoffman, P.F., and Henderson, J.B., 1972:
Archean and Proterozoic sedimentary and volcanic rocks of the Yellowknife-Great Slave Lake area, NWT; XXIV International Geological Congress, Montreal, Que., 1972, Field Excursion A 26.

Hoffman, P.F. and McGlynn, J.C., 1977:
Great Bear Batholith: a volcano-plutonic depression; *in* Volcanic Regimes in Canada, a Symposium, University of Waterloo, May 16-17, 1975, eds. W.R.A. Baragar *et al.*; Geological Association of Canada, Special Paper 16, p. 169-192.

Hoffman, P.F. and Pelletier, K.S., 1982:
Cloos Nappe in Wopmay Orogen: significance for stratigraphy and structure of the Akaitcho Group and implications for opening and closing of an early Proterozoic continental margin; *in* Current Research, Part A; Geological Survey of Canada, Paper 82-1A, p. 109-115.

Hoffman, P.F., St-Onge, M., Carmichael, D.M. and deBie, L., 1978:
Geology of the Coronation Geosyncline (Aphebian), Hepburn Lake Sheet (86J), Bear Province, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 78-1A, p. 147-151.

Hoffman, P.F., St-Onge, M.R., Easton, R.M., Grotzinger, J. and Schulze, D.E., 1980:
Syntectonic plutonism in north-central Wopmay Orogen (early Proterozoic), Hepburn Lake map area, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 80-1A, p. 171-177.

Hoffman, P.F., Tirrul, R., Grotzinger, J.P., Lucas, S.B. and Eriksson, K.A., 1984:
The externides of Wopmay Orogen, Takijuq Lake and Kikerk Lake map areas, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 84-1A, p. 383-395.

Irvine, T.N., 1970:
Geologic age and structural relations of the Muskox Intrusion; Geological Survey of Canada, Paper 70-1A, p. 149-153.

Irvine, T.N., 1971:
Emplacement of the Muskox Intrusion; Geological Survey of Canada, Paper 71-1A, p. 115-116.

Kerans, C., Ross, G.M. and Donaldson, J.A., 1981:
Stratigraphy, sedimentation and tectonism in the Hornby Bay and Dismal Lakes Groups, Proterozoic, NWT; *in* Mineral Industry Report, 1977, NWT; NWT Geology Division, DIAND, EGS 1981-11, p. 160-165.

Kidd, D.F., 1932:
Great Bear Lake area, NWT; Geological Survey of Canada, Summary Report, 1932, Part C.

______, 1936:
Rae to Great Bear Lake, Mackenzie District, NWT; Geological Survey of Canada, Memoir 187, 44 p.

Kindle, E.D., 1972:
Classification and description of copper deposits, Coppermine River area, District of Mackenzie; Geological Survey of Canada, Bulletin 214, 109 p.

King, J.E., Villeneuve, M.E., Spelmann, D. and Wilcox, K.H., 1986:
Geology of the northwestern metamorphic-internal zone and an outlier of the eastern Great Bear Magmatic Zone of Wopmay Orogen, Big Bend area, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 86-1A, p. 21-33.

Lang, A.H., 1952:
Canadian deposits of uranium and thorium (Interim Account); Geological Survey of Canada, Economic Geology Series No. 16.

Lord, C.S., 1941:
Mineral industry of the NWT; Geological Survey of Canada; Memoir 230, 136 p.

______, 1942:
Snare River and Ingray Lake map areas, NWT; Geological Survey of Canada, Memoir 235, 55 p.

______, 1951:
Mineral industry of District of Mackenzie, NWT; Geological Survey of Canada, Memoir 261, 336 p.

Lord, C.S. and Parsons, W.H., 1952:
Geology, Camsell river area, District of Mackenzie, NWT; Geological Survey of Canada map 1014A.

McGlynn, J.C., 1957:
Turn Lake, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Paper 58-4, 8 p.

______, 1971:
Metallic mineral industry, District of Mackenzie, NWT; Geological Survey of Canada, Paper 70-17.

______, 1974:
Geology of the Calder River map-area (86F), District of Mackenzie; *in* Report of Activities, Part A, April to October, 1973; Geological Survey of Canada, Paper 74-1A, p. 383-385.

________, 1975:
Geology of the Calder River map-area (86F), District of Mackenzie; *in* Report of Activities, April to October, 1974; Geological Survey of Canada, Paper 75-1A, p. 339-341.

________, 1976:
Geology of the Calder River (86F) and Leith Peninsula (86E) map-areas, District of Mackenzie; *in* Report of Activities, part A; Geological Survey of Canada, Paper 76-1A, p. 359-361.

________, 1977:
Geology of Bear-Slave Structural Provinces, District of Mackenzie; Geological Survey of Canada, Open File 445.

________, 1980:
Peninsular Sill, Takijuq Lake, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 80-1C, p. 227-228.

McGlynn, J.C. and Ross, J.V., 1963:
Arseno Lake map-area, District of Mackenzie, 86 B/12; Geological Survey of Canada, Paper 63-26, 7 p.

McGrath, P.H. and Hildebrand, R.S., 1984:
An estimate based on magnetic interpretation of the minimum thickness of the Hornby Bay Group, Leith Peninsula, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 84-1A, p. 223-228.

Miller, R.G., 1982:
The metallogeny of uranium in the Great Bear Batholith complex, NWT, unpublished Ph.D. thesis, University of Alberta.

Mursky, G., 1963:
Mineralogy, petrology, and geochemistry of Hunter Bay area, Great Bear Lake, NWT, Canada; unpublished Ph.D. thesis, Stanford University

________, 1973:
Geology of the Port Radium map-area, District of Mackenzie; Geological Survey of Canada, Memoir 374, 40 p.

Padgham, W.A., Shegelski, R.J., Murphy, J.D. and Jefferson, C.W., 1974:
Geological map of White Eagle Falls area, District of Mackenzie, NWT; Geological Survey of Canada, Open File 199.

Pelletier, K., 1986:
Preliminary geology of Ellington Lake area, NWT; NWT Geology Division, DIAND, EGS 1986-9.

Reichenbach, I., 1986:
Stratigraphy and structure of the early Proterozoic Bell Island Group, District of Mackenzie; *in* Current Research, Part B; Geological Survey of Canada, Paper 86-1B, p. 151-160.

Sasaki, A., 1969:
Sulphur isotope study of the Muskox Intrusion, District of Mackenzie; Geological Survey of Canada, Paper 68-46, 88 p.

Seaton, J.B., 1978:
The Mackenzie region: the Bear Structural Province; *in* Mineral Industry Report, 1975, NWT; NWT Geology Division, DIAND, EGS 1978-5, p. 40-53.

________, 1981:
The Bear Structural Province; *in* Mineral Industry Report, 1977, NWT; NWT Geology Division, DIAND, EGS 1981-11, p. 69-101.

________, 1983a:
Bear Structural Province; *in* Mineral Industry Report, 1978, NWT; NWT Geology Division, DIAND, EGS 1983-2, p. 80-108.

________, 1983b:
Bear Structural Province; *in* Mineral Industry Report, 1979, NWT; NWT Geology Division, DIAND, EGS 1983-8, p. 217-244.

________, 1984:
Bear Structural Province; *in* Mineral Industry Report, 1980/81, NWT; NWT Geology Division, DIAND, EGS 1984-5, p. 285-332.

Shegelski, R.J. and Murphy, J.D., 1972:
Geology, Rainy Lake, District of Mackenzie, NWT; Geological Survey of Canada, Open File 135.

Shegelski, R.J. and Thorpe, R.I., 1972:
Study of selected mineral deposits in the Bear and Slave Provinces; *in* Report of Activities, Part A: April to October, 1971; Geological Survey of Canada, Paper 72-1A, p. 93-96.

Smith, C.H., 1962:
Notes on the Muskox Intrusions, Coppermine River area, District of Mackenzie; Geological Survey of Canada, Paper 61-25, 16 p.

________, 1967:
Geology, Muskox Intrusion, District of Mackenzie; Geological Survey of Canada, Map 1213A and 1214A.

St-Onge, D.A., 1984:
Surficial deposits of the Redrock Lake area, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 84-1A, p. 271-278.

St-Onge, M.R. and Hoffman, P.F., 1980:
"Hot-side-up" and "hot-side-down" metamorphic isograds in north-central Wopmay Orogen, Hepburn Lake map-area, District of Mackenzie; *in* Current research, Geological Survey of Canada, Paper 80-1A, p. 179-182.

St-Onge, M.R., King, J.E., Lalonde, A.E., 1984:
Deformation and metamorphism of the Coronation Supergroup and its basement in the Hepburn Metamorphic-Plutonic Zone of Wopmay Orogen: Redrock Lake and the eastern portion of Calder River map areas, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 84-1A, p. 171-180.

Thompson, P.H. and Ashton, K., 1984:
Preliminary report on the geology of the Tinney Hills-Overby Lake (W 1/2) map area, District of Mackenzie: a look at the Thelon Tectonic Zone northeast of the Bathurst Fault; *in* Current Research, Part A; Geological Survey of Canada, Paper 84-1A, p. 415-423.

Thorpe, R.I., 1970:
Geological exploration in the Coppermine River area, Northwest Territories, 1966-1968; Geological Survey of Canada, Paper 70-47, 150 p.

________, 1972:
Mineral exploration and mining activities, NWT, 1966 to 1968 (excluding the Coppermine River area); Geological Survey of Canada, Paper 70-70, 242 p.

Tirrul, R., 1985:
Nappes in the Kilohigok Basin and their relation to the Thelon Tectonic Zone, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 85-1A, p. 407-420.

Tremblay, L.P., 1971:
Geology of Beechey Lake map-area, District of Mackenzie, a part of the western Canadian Precambrian Shield; Geological Survey of Canada, Memoir 365, 56 p.

Wilson, J.T. and Lord, C.S., 1942:
Snare River and Ingray Lake map-areas, NWT; Geological Survey of Canada, Memoir 235, 55 p.

CHAPTER 8
SLAVE STRUCTURAL PROVINCE

J.B. Seaton, Bear - north Slave District Geologist
Walter A. Gibbins, Arctic Islands District Geologist
Dorothy Atkinson, south Slave - Cordilleran District Geologist
Valerie Jackson, Project Geologist
Kate Hearn, Research Geologist

INTRODUCTION

This introductory section to the Slave Structural Province is essentially the same as that in the 1984-85 Mineral Industry Report, but the list of subdivisions under which properties are discussed has been modified.

About two-thirds of the Slave Structural Province is made up of sediments and volcanics of the Archean Yellowknife Supergroup that have been metamorphosed under greenschist to upper amphibolite grade conditions (Frith, 1978; Nielsen, 1978, Percival, 1979; Thompson, 1978). The supracrustal rocks, of which about 15% are volcanics, are exposed in sinuous and anastamosing belts locally wrapped around basement gneisses and commonly flanked, separated or interrupted by quartz diorite, quartz monzonite, granodiorite and granite intrusions. Relatively narrow volcanic belts containing various proportions of mafic, intermediate and felsic components are commonly flanked on one, rarely on both, sides by metasediments. The metasediments are predominantly greywacke, commonly interbedded with thinner pelitic layers with phyllitic or slaty cleavage. Topographically recessive phyllite may overlie and flank the volcanics or may be found locally within the volcanic sequence.

Contact relations of granitoid plutons with surrounding supracrustal rocks are generally concordant (Henderson, 1978), although crosscutting granodiorites, quartz monzonites and associated pegmatites have been mapped. Locally the plutons are bordered by migmatite. Contact metamorphic aureoles may be extensive or practically absent.

Economic mineral discoveries have been mainly in the volcanics, and consequently these rocks have been more intensely studied. Most of the volcanic belts have been covered, in many cases more than once, by airborne magnetic and EM surveys which have outlined numerous conductors mostly related to graphitic volcanogenic sediments or extensive zones of disseminated sulphides.

Since the early 1980's, spurred by a favourable economic climate for gold exploration and the opening of Lupin Mine, areas underlain by metasediments have been extensively explored for auriferous iron formation.

The extent of pre-Yellowknife Supergroup basement is still speculative and will remain so until more geochronological studies and detailed mapping have been done. Locally, plutonic gneisses and massive rocks of tonalitic composition unconformably underlie supracrustal rocks of the Yellowknife Supergroup, as at Point Lake (Baragar and McGlynn, 1976; Henderson, 1977; Henderson and Easton, 1977a,b). Commonly the basal contact of the Yellowknife Supergroup has been obliterated by granitic intrusions. Broad zones of granitic gneiss, migmatite and mixed gneisses, including or derived from Yellowknife Supergroup rocks (unit An of McGlynn, 1977), may include basement that is so far unrecognized. Some tonalitic clasts in the Yellowknife Supergroup sediments may be derived from unroofed synvolcanic plutons.

Volcanic belts may comprise more than one cycle of volcanism, as do the Back River volcanic complex and the Courageous Lake-McKay Lake volcanic belt. Distally, the volcanics, in most cases, interfinger with the sediments that fill the greater part of the basins. Iron formations within the sediments may be distal products of volcanism. The sediments clearly show complex folding, whereas in the more competent volcanics the effect of such folding is obscure.

In this chapter, properties are grouped under headings indicative of common geological or, in a few cases, geographical settings. These headings and authors are:

1. Hiukitak River - Tinney Hills area, Walter A. Gibbins;
2. Hope Bay volcanic belt, Walter A. Gibbins;
3. High Lake supracrustal belt, J.B. Seaton;
4. Wilberforce Basin, J.B. Seaton;
5. Beechey Lake Basin, J.B. Seaton;
6. Regan Lake supracrustal belt, J.B. Seaton;
7. Contwoyto River metasedimentary belt, J.B. Seaton;
8. Point Lake - Itchen Lake - Contwoyto Lake metasedimentary belt, J.B. Seaton;
9. Indin Lake supracrustal belt, Dorothy Atkinson;
10. Russell Lake - Slemon Lake supracrustal belt, Valerie Jackson;
11. Yellowknife supracrustal belt, Dorothy Atkinson and Valerie Jackson;
12. Indian Mountain Lake, Dorothy Atkinson
13. Courageous Lake - MacKay Lake, Kate Hearn.

Supracrustal rocks of the Archean Yellowknife Supergroup include metavolcanic belts, metasedimentary belts, and mixed belts with important metavolcanic and metasedimentary components referred to as supracrustal belts. They are separated from one another by granitoid intrusions, basement gneisses and granitoids and/or Proterozoic sediments or Quaternary cover. It is not always possible to define the edge of a supracrustal belt precisely in the field, so for convenience projects that extend over adjacent granitic rocks along boundaries of a belt are included in the section on the appropriate volcanic belt.

BATHURST BLOCK - NORTHEASTERN SLAVE PROVINCE

In 1986-87, mineral exploration in the Bathurst Block (Padgham, 1981), the northeastern Slave Province, or Bathurst Terrane, was monitored by Walter A. Gibbins. The geology of the Bathurst Block was first outlined by Geological Survey of Canada helicopter supported reconnaissance mapping in the early 1960's (Fraser, 1964).

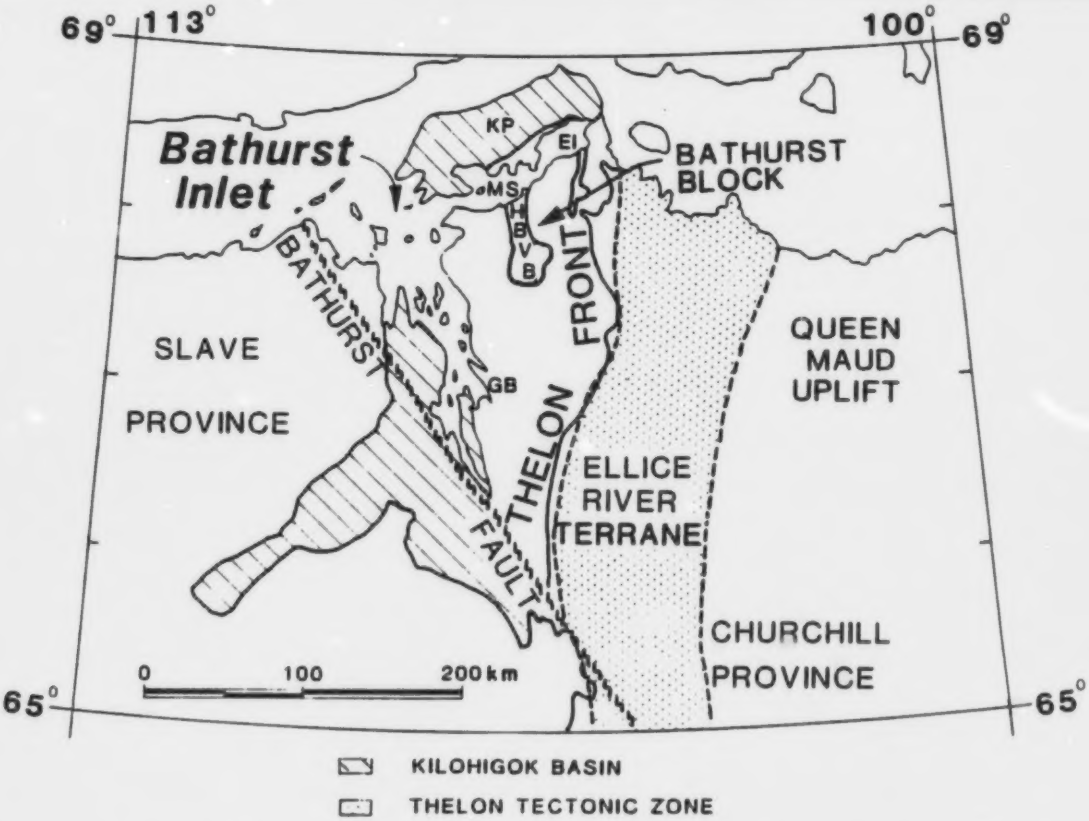


FIGURE 8-1: Regional geology of the northeastern Slave Province - Bathurst Block, modified from Thompson, 1986. Abbreviations: HBVB - Hope Bay volcanic belt; KP - Kent Peninsula; MS - Melville Sound; GB - Gordon Bay; EI - Elu Inlet.

Geographically, the Bathurst Block is bounded on the west by Bathurst Inlet, on the north by Melville Sound and Elu Inlet, and on the south and east by an imaginary line from the south end of Bathurst Inlet that swings northeast to Overby Lake, then north to the Arctic Coast. Geologically, it is bounded unconformably on the north and west by Goldburn Group sediments of the Proterozoic Kilohigok Basin (Campbell and Cecile, 1976, 1981), and on the south and east by the Ellice River Terrane along the Thelon Front (Fig. 8-1).

In 1986-87, mineral exploration was mainly for Lupin-type gold deposits in the Hiukitak River-Tinney Hills area (76 J) and gold or silver deposits in the Hope Bay volcanic belt (NE 76O, 77 A/3).

HIUKITAK RIVER - TINNEY HILLS AREA

Mineral exploration in the Tinney Hills - Hiukitak River area (76 J north half) was mainly for Lupin-type gold deposits in amphibolite iron formation horizons of Archean metasediments of the Yellowknife Supergroup. Canadian Nickel Ltd. staked a Lupin-type gold showing near Tinney Cove (76 J/11) in 1964 (Schiller, 1965; Thorpe 1972), however, very little mineral exploration was done in the area for the next 20 years. In 1984, increased gold prices, highly profitable operations at the recently developed Lupin Mine, the potential for additional Lupin-type deposits (Gibbins, 1981) and 1:250 000 scale mapping by the Geological Survey of Canada (Thompson and Aston, 1984; Thompson and Culshaw, 1985) all contributed to a sharp increase in exploration by a number of groups mainly in the Tinney Hills - Hiukitak River area. Echo Bay Mines Ltd., owner and operator of the Lupin Mine, became the most active company in the area and a large number of claims were staked in 1984 and 1985 (Seaton *et al.*, 1987, p. 195).

Much of the 1984-85 work was not submitted in time to be included in the 1984-85 Mineral Industry Report, so it is included here with the 1986-87 work. Some of the claims, such as NEST and JAN, were explored in some detail, but assessment work was not filed and the claims lapsed. Little or no work was done on other claims like the BEAK (76 J/7,10) and SHEL (76 J/16) claims. In 1986-87, both Echo Bay Mines Ltd. and Silver Hart Mines Ltd. conducted diamond drilling in the area.

REGIONAL GEOLOGY

Thompson and others (1985) divided the crystalline rocks of the Tinney Hills - Hiukitak River area into the Bathurst and Ellice River Terranes, west and east respectively of the "main boundary zone" (Fig. 8-1). In the south half of the area, this line coincides with a marked change in lithology, a relatively low-grade transcurrent shear zone, a characteristic aeromagnetic expression, and a swarm of metamorphosed and variably deformed diabase/gabbro dykes. This boundary was taken to be the western limit of the Thelon Tectonic Zone, that is the Thelon Front. The boundary is drawn along the contact between a "pink" gneissic to migmatitic granitoid unit and the main mass of metamorphosed supracrustal rocks of the Yellowknife Supergroup (Thompson *et al.*, 1986).

Most of the Bathurst Block is made up of aluminosilicate-bearing migmatites derived from pelitic schist and metagreywacke of the Yellowknife Supergroup. Thin zones or lenses of a highly variable lithologic package, including layered amphibolite, fine-grained quartzofeldspathic gneiss, pelitic schist/psammite, migmatite, marble/calcsilicate gneiss and metagabbro, are scattered across the metasedimentary terrane and associated with the migmatitic/plutonic complex to the north (Fig. 8-2).

Metamorphosed iron formation is composed mainly of garnet, quartz, grunerite, with variable amounts of plagioclase, hornblende, magnetite, pyrrhotite, pyrite and traces of chalcopyrite. Usually marked by a gossan, these rocks take the form of boudins or layers in the predominantly metasedimentary parts of the Yellowknife Supergroup. Commonly, thin layers of amphibolite and/or fine-grained quartzofeldspathic rocks are associated. The gossans mapped by Thompson (Fig. 8-2) are rusty metasediments, relatively rich in sulphides.

Across the map area it is possible to divide the metamorphic history into an early high-grade event and a later lower grade event. From the point of view of mineral exploration an important aspect of this map is the way in which the economically interesting Yellowknife Supergroup has been differentiated despite the widespread migmatization and complex deformation of these rocks. More specifically, it has been shown that gold-bearing meta-iron formation of the Lupin type is not restricted to the low-grade parts of the Yellowknife Supergroup. These rocks occur at all metamorphic grades and the gross stratigraphy with which they appear to be associated can be traced from Gordon Bay well into the migmatitic metasedimentary terrane (Thompson, 1986).

LB 1-9 CLAIMS

Chevron Minerals Ltd.	Gold
1900 - 1055 W. Hastings St.	76 J/9,10,15,16
Vancouver, B.C., V6E 2E9	66°44'37"N
	106°32'10"W

REFERENCES

Thompson (1986); Thompson *et al.* (1985, 1986).
DIAND assessment report: 082522.

PROPERTY

LB 1-9.

LOCATION

The LB claims are southeast of Bathurst Inlet, 6 to 18 km south of the Hiukitak River and 22 to 28 km east of the southeastern most Gordon Bay (13 in Fig. 8-2). The claims are centred near 66°45'N and 106°30'W, 600 km northeast of Yellowknife.

HISTORY

Gold showings were discovered by prospectors William W. Kizan and Lloyd E. Anderson in 1985. They recorded the LB 1 and 2 claims in September 1985 and LB 3 and 4 in July 1986. Chevron Minerals Ltd. confirmed anomalous gold assays in 1985 and optioned the claims. Later they formed a joint venture with Galveston Resources Ltd. The LB 5-9 claims were added in April 1987. There is no evidence of prior work on these showings.

DESCRIPTION

The geology of the area is described by Thompson and others (1985, 1986) and was mapped at 1:125 000 scale by Thompson (1986). The claims are underlain by Archean rocks, mainly Yellowknife Supergroup metasediments and granitic rocks of the Bathurst Terrane (Fig. 8-2). The sediments are turbidite greywackes and pelites that have undergone middle to upper amphibolite facies metamorphism to form cordierite knotted schists and sillimanite schist, gneiss or migmatite.

Detailed mapping at 1:10 000 scale by Chevron Minerals Ltd. was based on several sub-units of the Yellowknife Supergroup. Particular attention was given to tracing iron formation, considered to be a potential ore unit. Silicate (amphibolite ± garnet), sulphide (pyrite) and oxide (magnetite) facies are present. Similar host rocks at Lupin Mine, Homestake Mine, South Dakota and Jardine Mine, Montana contain large high-grade gold deposits.

Two or more periods of tectonism is shown by folded, stretched and boudinaged rocks. Three major north-northeast-trending faults displace iron formation and possibly isograds and late gabbro dykes.

CURRENT WORK AND RESULTS

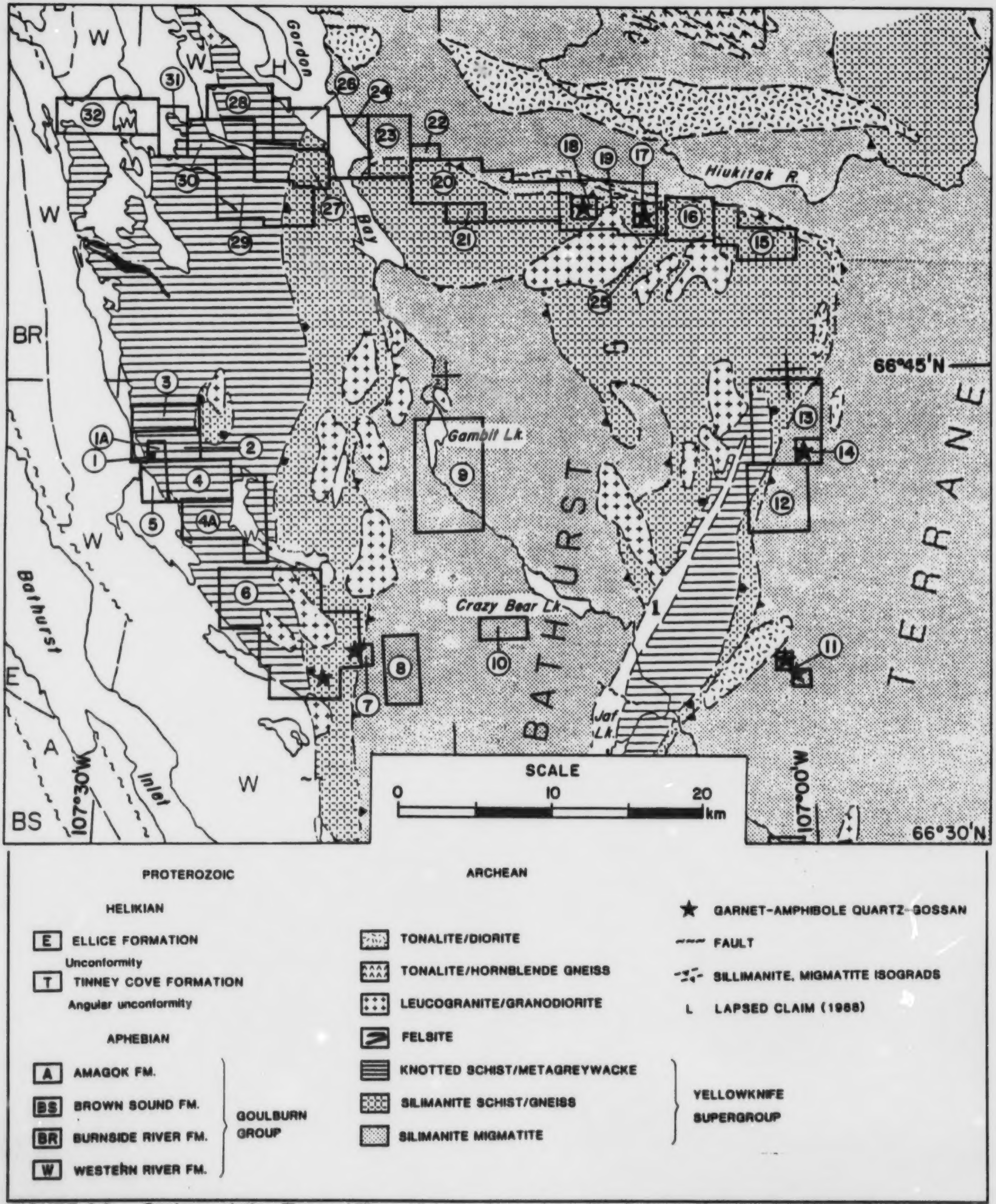
The 1987 work required seven people for three months and was designed to validate and delineate known showings, prospect for additional showings, to better understand the geology and gold distribution, and to identify and evaluate drill targets. Fourteen showings were examined by 85 km of grid, 278 m of trenching, detailed mapping (1:500 or 1:100 scale), lithogeochemistry, and petrography. The entire claim block was mapped at 1:10 000 scale and flown with a DIGHEM III survey.

Trace element data from 268 samples of iron formation were analyzed using a statistics package for single and multi-element comparisons. Data from known productive and barren iron formations elsewhere in the Slave Province were compared. Gold was found to correlate with arsenic, sulphur and copper. These elements are present in amounts comparable to other economic iron formations, but bismuth, lead, antimony and silver are lower. Factor analysis ranked the showings using the Slave function and principle components function. According to these rankings, showings at the north and south ends of the claim block have the best gold potential.

Some specimens are clearly clastic sediments, but the lack of micas and feldspars indicate the rest are typical of Slave Province iron formation. The absence of any sign of hydrothermal or carbonate alteration, the lack of base-metal sulphide minerals, and the association of visible gold within silicates or arsenopyrite-loellingite (but not pyrite) are all considered typical of Slave Province iron formation deposits. Pyrrhotite is rare and laminated sulphides of Lupin-type deposits are absent. Correlation of geology and geophysical mapping shows that the iron formation can be over or adjacent to magnetic anomalies, near weak EM or VLF EM conductors, and associated with a broad resistivity anomaly. Gabbro dykes are thought to account for most of the magnetic anomalies because magnetite is uncommon and pyrrhotite very rare in the iron formation.

The best chip sample assays are from Showing #1: 90.5 g/t Au over 48 cm and 29.8 g/t Au over 57 cm, showing #5: 24.7 g/t Au over 75 cm, 11.4 g/t Au over 75 cm, 8.5 g/t Au over 79 cm, and 6.38 g/t Au over 25 m. Other samples from the showings contain gold in the range of 1 to 6 g/t.

Drilling, ground geophysics and additional trenching are recommended.


W
W
H
Gordon
Bay
Hiukitak R.
Gambit Lk.
Crazy Bear Lk.
Jaf Lk.
Bathurst
Inlet
BR
E
A
BS
W
BATHURST TERRANE
66°45'N
66°30'N
107°30'W
107°00'W
SCALE
0
10
20
km
1
2
3
4
4A
5
6
7
8
9
10
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12
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14
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16
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29
30
31
32
1A
PROTEROZOIC
HELIKIAN
E ELLICE FORMATION
Unconformity
T TINNEY COVE FORMATION
Angular unconformity
APHEBIAN
A AMAGOK FM.
BS BROWN SOUND FM.
BR BURNSIDE RIVER FM.
W WESTERN RIVER FM.
GOULBURN GROUP
ARCHEAN
TONALITE/DIORITE
TONALITE/HORNBLENDE GNEISS
LEUCOGRANITE/GRANODIORITE
FELSITE
KNOTTED SCHIST/METAGREYWACKE
SILIMANITE SCHIST/GNEISS
SILIMANITE MIGMATITE
YELLOWKNIFE SUPERGROUP
★ GARNET-AMPHIBOLE QUARTZ-GOSSAN
FAULT
SILLIMANITE, MIGMATITE ISOGRADS
L LAPSED CLAIM (1988)

FIGURE 8-2: Geology of the Tinney Hills - Hiukitak River Area (76 J) from Thompson, 1986. Claims in good standing December 1987. Claims marked L had lapsed December 1988.

KEY TO PROPERTIES - FIG. 8-2

No.	NTS	Regist'd	Claims	Owner
1	76J/11	82-10-18	G&T2	BCHE
1A	76J/11	83-09-19	G&T 1,3,6	BCHE
2	76J/11	84-03-26	FOX 1,2	SHML
3	76J/11	85-09-09	FOX 5,6	SHML
4	76J/11	84-03-26	FOX 3	SHML
4A	76J/11	84-03-26	CHAR 1,2	SHML
5	76J/11	85-09-09	FOX 4	SHML
6	76J/11	84-10-09	HEN 1-6	EBML
7	76J/11	85-03-18	BC 6	BCHE
L8	76J/11	85-08-22	NEST	EBML
L9	76J/10,11	85-08-12	JAN 1-3	EBML
10	76J/10	84-08-26	CLEAR	EBML
11	76J/9,10	85-03-18	BC 4,5	BCHE
12	76J/9,10	85-08-27	WING	EBML
13	76J/9,10	85-09-13	LB 1-9	CGJV
14	76J/9	85-10-28	BC 3	BCHE
L15	76J/15,16	85-10-17	EGG 2,3	EBML
L16	76J/15	85-07-25	EGG	EBML
17	76J/15	85-03-18	BC 2	BCHE
18	76J/15	85-03-18	BC 1	BCHE
19	76J/15	85-09-3,6	BEAR1,4-6	EBML
20	76J/14,15	85-08-22	BEAR 2,3	EBML
21	76J/15	85-09-06	BEAR 7	EBML
L22	76J/14	85-10-17	BEAR 10	EBML
23	76J/14	85-09-27	BEAR 9	EBML
24	76J/14	85-09-27	HUNT 8	EBML
25	76J/14	85-10-17	BEAR 8	EBML
26	76J/14	85-10-17	HUNT 7,13	EBML
27	76J/14	84-10-09	HUNT 1,2	EBML
28	76J/14	85-09-27	HUNT 9,10	EBML
29	76J/14	85-28-22	HUNT 4,5	EBML
30	76J/14	85-07-29	HUNT 3	EBML
31	76J/14	85-10-17	HUNT 6	EBML
32	76J/13,14	85-09-17	HUNT11,12	EBML
33	76J/16	87-05-15	BL 1-4	LAWK
34	76J/15	87-08-04	BL 5,6	LAWK
L35	76J/16	85-08-22	SHEL	EBML
36	76J/13	86-10-02	BC - 9	BCHE
37	76J/15	86-07-29	ENEX	ENEX
L38	76J/	85-08-22	BEAK	EBML

Abbreviations:
BCHE - Bear Creek Hills Estate Ltd.
EBML - Echo Bay Mines Ltd.
SHML - Silver Hart Mines Ltd.
CGJV - Chevron Galveston Joint Venture
ENEX - Enexco International Ltd.
LAWK - Lloyd Anderson/William Kizan

* L Lapsed - December 88.

WING CLAIM

Echo Bay Mines Ltd.
354 Granville Sq.
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
76 J/9,10
66°41'N, 106°30'W

REFERENCES

Thompson (1986); Thompson and Culshaw (1985); Thompson *et al.* (1985, 1986).

DIAND assessment reports: 082573, 082574.

PROPERTY

WING.

LOCATION

The WING claim is in the Hiukitak River area, east of Bathurst Inlet and about 625 km northeast of Yellowknife. It is 28 km southeast of the head of Gordon Bay and 25 km southwest of the big bend in the Hiukitak River (12 in Fig. 8-2) and adjoins the LB claims to the north and the BC 3 claim to the northeast.

HISTORY

Thompson and Culshaw (1985) mapped several quartz-amphibole-garnet gossans in the area, including one on the adjacent BC 3 claim. The BC 3, LB 1 and 2, and WING claims were staked in March, August and September 1985 respectively.

DESCRIPTION

Thompson and others (1985, 1986) describe the area as sillimanite migmatite of the Yellowknife Supergroup. Narrow discontinuous lenses of iron formation were found in the north half of the claim. Foliation in the iron formation trends north-northeast and dips steeply to the east. Sulphide-poor iron formation predominates, but small zones of sulphide-rich (pyrite/arsenopyrite) and magnetite zones are also present. Rusty metasediments contain up to 10% pyrite, but no gold.

The central part of the eastern claim boundary is cut by a northeast-trending diabase dyke and a small stock (less than 2 km diameter) of massive medium-grained granodiorite.

CURRENT WORK AND RESULTS

In 1985 aerial reconnaissance was followed with a ground traverse that revealed anomalous gold content in iron formation (2.91 and 3.61 g/t Au at showing B-40, Fig. 8-3). However, B-40 had been located incorrectly and the showing is within the LB1 claim. The WING claim was staked to protect the southerly extension of iron formation at B-40 and a magnetometer survey tested 800 m by 500 m of this area. The strongest anomaly corresponds to diabase boulders, but a second weaker anomaly is along strike with the iron formation at B-40.

In 1986, a geochemical program identified a few gold-bearing iron formation boulders south of B-40. One sample from the south end of a small lake on the B-40 trend assayed 11.52 g/t Au. A few samples from the northern east boundary gave low gold assays, ranging from 1 to 2.5 g/t Au.

In May 1987, a 250 by 500 m grid was established on Kizan Lake, a small lake that extends south from near the mid-point of the northern boundary of the WING claim. A magnetometer survey suggests that iron formation at B-40 on the LB claims may extend under Kizan Lake.

Exploration in the southern portion and south of the claim was unsuccessful in finding iron formation or anomalous gold assays.

JAN CLAIMS

Echo Bay Mines Ltd.
354 Granville Sq.
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
76 J/10,11
66°41'N, 107°W

REFERENCES

Thompson (1986).

PROPERTY

JAN 1-3.

LOCATION

The claims are centred on the southern half of Gambit Lake, about 30 km east of Tinney Cove on Bathurst Inlet (9 in Fig. 8-2). The area is about 500 km northeast of Yellowknife.

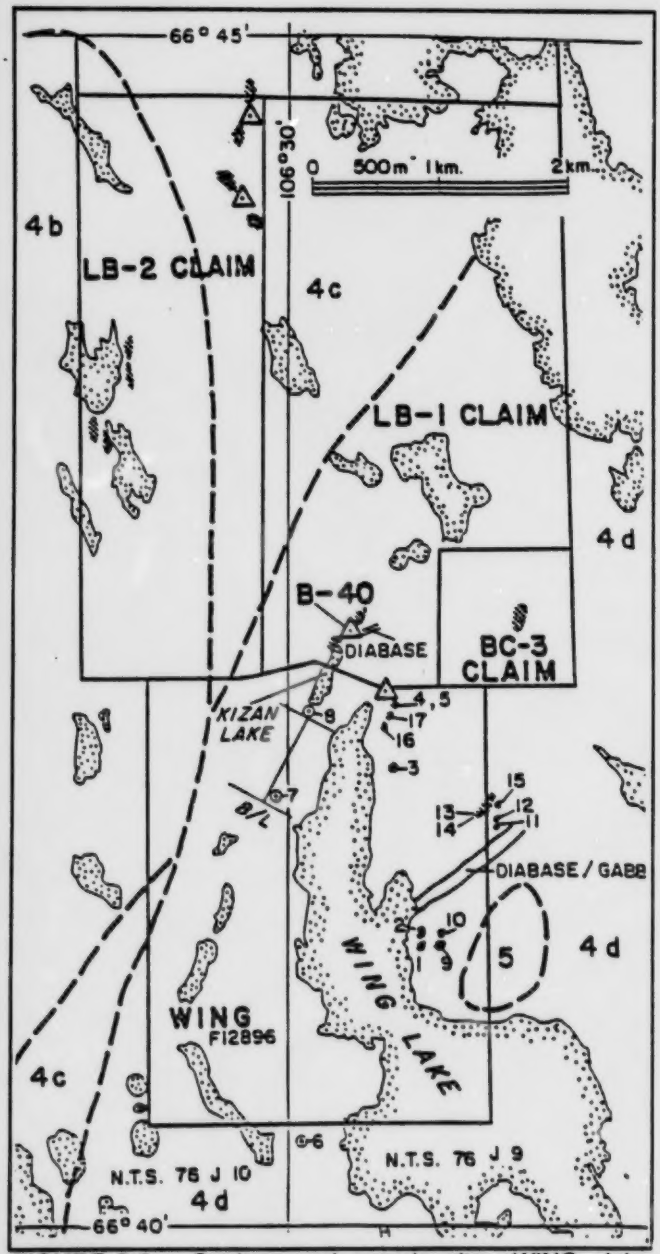


FIGURE 8-3: Geology and sample sites WING claim, from DIAND assessment report 082573.

ASSAY SAMPLE NUMBERS AND GRADES

1	(.07)	7	(.21)	13	(1.03)
2	(.34)	8	(11.52)	14	(.17)
3	(.07)	9	(.21)	15	(.27)
4	(1.94)	10	(.48)	16	(.24)
5	(1.54)	11	(2.50)	17	(.24)
6	(.03)	12	(1.37)		

LEGEND (AFTER THOMPSON 1986)

4b - KNOTTED SCHIST AND METAGREYWACKE
4c - SILLIMANITE SCHIST / GNEISS
4d - SILLIMANITE MIGMATITE
5 - TONALITE / GRANODIORITE
6 - TWO MICA GRANITE - GRANODIORITE
10 - WESTERN RIVER FORMATION (Proterozoic)
// - DIABASE DYKE
△ - GOLD SHOWING 34 g/t
▬ - IRON FORMATION
⊕ - 22329 (11.52) SAMPLE NUMBER (Au g/t)

HISTORY

The JAN claims were recorded in August 1985, following a regional reconnaissance sampling program. They lapsed in 1987.

DESCRIPTION

The claims encompass sillimanite migmatite gneisses of the Yellowknife Supergroup (Fig. 8-2; Thompson, 1986).

CURRENT WORK AND RESULTS

In 1986, a grid was established over the George showing on JAN 1. This showing contains large (up to 5 cm diameter) books of biotite and abundant red garnets (J.B. Seaton, pers. com. 1986). A chip sample assayed 10-12 g/t Au across 3 m. The showing is confined to a 1500 m² pod of iron formation.

NEST CLAIMS

Echo Bay Mines Ltd.
354 Granville Sq.
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
76 J/11
66°35'N, 107°04'W

REFERENCES

Ames (1986); Thompson (1986).

PROPERTY

NEST Claim.

LOCATION

The NEST claim is near Bear Creek Hills, 15 km east of southern Bathurst Inlet (8 in Fig. 8-2).

HISTORY

The NEST claim was recorded in August 1985, as a result of a regional reconnaissance sampling program. The property was mapped and sampled in 1985 (Ames, 1986).

The claim lapsed in late 1987.

DESCRIPTION

The NEST claim is underlain by an auriferous iron formation within migmatite gneisses of the Archean Yellowknife Supergroup (8 in Fig. 8-1). Iron formation forms boudinaged pods within sillimanite gneiss and is predominantly silicate facies with disseminations of magnetite and iron sulphide (Ames, 1986). Two phases of regional metamorphism were recognized.

According to Ames (1986), the iron formation consists of 1-2 cm quartzite bands alternating with similar iron silicate bands composed primarily of grunerite and hornblende with minor garnet, pyroxenes and quartz. Disseminated and massive pyrite, arsenopyrite and magnetite are present locally in the iron silicate bands. Gold is generally enriched in the iron formation. Very anomalous gold concentrations in the nose of a minor antiformal structure in the iron formation suggest remobilization of syngenetic gold into structural sites during the high grade metamorphic event.

CURRENT WORK AND RESULTS

1985: The only information available for the 1985 field season comes from Ames (1986). A grid was set up and detailed mapping, sampling, a magnetic survey, and possibly a VLF EM survey, were done.

Echo Bay Ltd.'s analysis of chip sampling across iron formation bands indicated anomalous gold concentrations throughout the iron formation. Even sulphide-poor samples yield over 5 g/t Au. However, sulphide-rich samples are more anomalous with a maximum gold content of 91.37 g/t. Within the sulphide-rich bands gold concentrations are irregular and vary dramatically over very short distances both along and across strike. For example: XR19164 (1.75 g/t Au) and XR9426 (86.09 g/t Au) were taken 1 m apart across strike; and XR20273 (12.75 g/t) and XR19152 (0.21 g/t) were collected 1 m apart along strike.

Gold content has a strong positive correlation with sulphur content, but is not specifically associated with any one mineral such as pyrite or arsenopyrite.

Gold is structurally controlled in the NEST iron formation, with the highest grades in the nose of a minor antiformal structure.

Microprobe analysis of pyroxenes and amphiboles demonstrate these to be very iron-rich species. Magnetite-rich samples show only slight iron enrichment in actinolite-hornblende and grunerites. Calcium is enriched in hornblende. Analysis of pyroxenes revealed a number of species including ferrohypersthene, subcalcic ferroaugite and hedenbergite.

1987: Three holes, totalling 210 m, were drilled on the NEST zone (65°35'N, 107°04'W). Evidently, the results were not encouraging, as no assessment work was submitted and the claims were allowed to lapse.

HEN CLAIMS

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	76 J/11
200 Granville St.	66°34-39'N
Vancouver, B.C., V6C 1S4	107°08-22'W

REFERENCES

Fraser (1964); Thompson (1986); Thompson *et al.* (1985, 1986).

DIAND assessment report: 082598.

PROPERTY

HEN 1-6 (6270 ha).

LOCATION

The claims are near the southern end of Bathurst Inlet (6 in Fig. 8-2). The area is 575 km northeast of Yellowknife and 215 km east-northeast of Lupin Mine at Contwoyto Lake.

HISTORY

The claims were staked in 1984, following helicopter-reconnaissance exploration. During the 1960's Roberts Mining Ltd. explored the area north of the HEN claims (now the G&T claims), but apparently did not explore the area of the HEN claims.

DESCRIPTION

The area is underlain by highly metamorphosed sediments of the Archean Yellowknife Supergroup separated by large zones of granodiorite and granitic gneisses. The area has been mapped by Fraser (1964) and by Thompson and others (1985, 1986). Proterozoic sedimentary rocks of the Kilohigok Basin overlie Archean rocks along the southwestern edge of the claim block (Figs. 8-2 and 8-4).

The principal exploration target is gold in sulphidic silicate iron formation, similar to that found in the Lupin and Homestake mines. In the claim area iron formation commonly trends north-northwesterly and outcrops are fairly abundant (Fig. 8-4). Additional iron formation is believed to underlie the numerous lakes. The iron formation is mainly sulphide-poor silicate facies iron formation, however, oxide and sulphide facies are present as well.

CURRENT WORK AND RESULTS

1984: Eight gold showings were identified on the HEN claims (Fig. 8-4). All of these are related to iron formation.

B-1 Showing (HEN 1)

Grab samples XR8837, 8838 assayed 2.43 and 3.43 g/t Au and soil sample 84 RM149 from the same area returned 4160 ppb Au. Resampling yielded a maximum value of 0.93 g/t Au over 1 m. One soil and 21 rocks samples were collected.

The highest assay for samples collected over a 2 km strike length to the north was 1.20 g/t Au.

The zone ranges up to 15 m in width and consists of amphibolite and garnet amphibole layers. Pyrite content ranges from traces to 10%. Thin magnetite seams were observed in amphibolite. Arsenopyrite is present in trace amounts.

The zone strikes north and dips at 50-70 degrees east. Continuous iron formation ends 200 m south of the B-1 showing, but there are isolated pods and lenses along strike that may continue south to southeast to the B 5-7 showings.

B-2 Showing (HEN 1)

Six lenses of iron formation were sampled in a 300 m by 50 m area at the southern end of Pippin Lake; 25 rock samples were taken. The best assay, 3.98 g/t Au, was from a grab sample within a zone 200 m long and up to 5 m wide. Four other samples from this zone assayed between 1 and 2 g/t Au. The other zones are lensoid in nature and contain localized gold up to 3.84 g/t Au.

Locally, amphibolite and garnet amphibole rocks contain up to 20% sulphides and arsenopyrite. Minor quartz veins are present.

B-3 Showing (HEN 1)

Sample XR 15803 assayed 2.88 g/t Au. The remaining eight were less than 0.48 g/t Au. Two small subparallel lenses or iron formation up to 1 m in width, contain small pods (up to 20 by 30 cm) of sulphides, mainly pyrrhotite, pyrite, and minor arsenopyrite.

Quartz veins up to 1 m in width were also sampled.

B-4 Showing (HEN 1)

Grab Samples XR 15871 and 13810 assayed 22.35 and 17.49 g/t Au, and chip samples XR 13763 and XR 13764 assayed 10.18 and 6.00 g/t Au over 1.5 m and 1.2 m respectively. A 25 m wide lens of iron formation is exposed for 250 m. To the south it pinches out while to the north it is covered by a lake. It comprises well banded amphibolite and garnet amphibole rocks with local sulphide-rich bands and pods and contains up to 30% pyrite, arsenopyrite and pyrrhotite.

Several smaller lenses of iron formation were sampled in the immediate area and sample XR 15807 gave 4.25 g/t Au from massive pyrite with 5% arsenopyrite. A total of 22 samples were taken.

B-5 Showing (HEN 1)

The following is a list of the highest assays from 21 samples taken in the area:

Gold Assays (g/t)

Sample Number	Original	Resample	Chip Sample
XD 15879	187.72	2.81	0.27/1.1 m
XD 15878	53.57	27.63 and 15.72	1.11/1.8 m
XD 13760 (20 m S 879)	-	-	3.74/1.3 m
XD 13518 (60 m N 879)	5.35	-	3.87/1.0 m

Lenses of iron formation are poorly exposed between two large north-northwest-trending diabases on the northwest shore of Arseno Lake. The iron formations dip at 50° to the east and can be traced intermittently to the northwest for over 1 km.

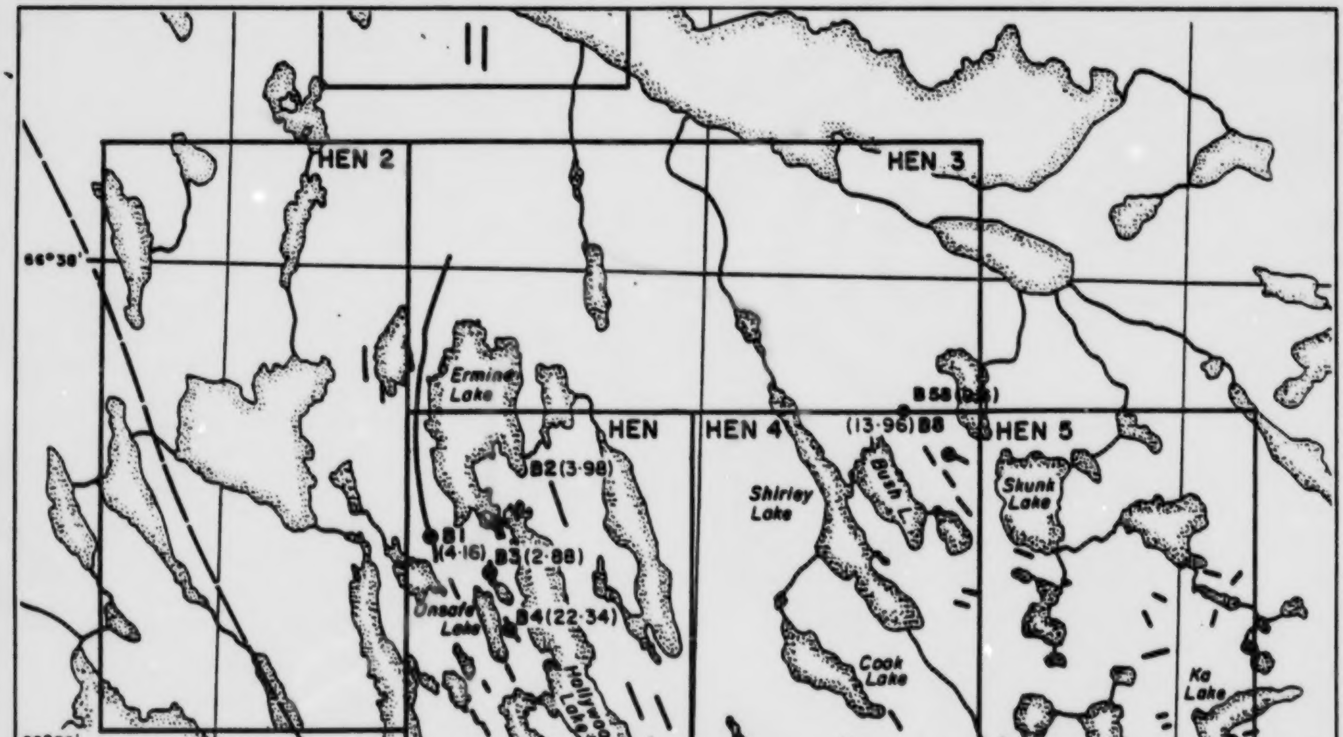

II
HEN 2
HEN 3
66°38'
Ermine Lake
HEN
HEN 4
HEN 5
B58
(13·96)B8
Bush L.
Shirley Lake
Skunk Lake
B2(3·98)
B1 (4·16)
B3(2·88)
B4(22·34)
Unsafe Lake
Hollywood Lake
Cook Lake
Ka Lake
66°36'
B5 (187·72)
1985 Campsite
Arseno Lake
Rooster Lake
(45·67)B6
HEN 6
Bras d'Or Lake
1 km 0 500m 1000m
GOULDBURN GROUP
LEGEND
B7 (6·75)
B1 (4·16)
gold showing
maximum gold assay (g/t)
iron formation
unconformity
66°34'
107°20'
107°15'
107°10'

FIGURE 8-4: Gold showings HEN claims, from DIAND assessment report 082598.

B-6 Showing (HEN 1)

Grab Sample XR 15890 assaying 45.87 g/t Au was taken from a lens of iron formation located on a point on the southwest side of Arseno Lake. Three other grabs gave 8.30, 2.67 and 2.37 g/t Au. These high assays came from a pod of banded pyrite (2-5%) and arsenopyrite (10%). Minor magnetite is present. There is more than one lens of iron formation, but field reports give no details of size. The showing is southeast along strike from B-5.

Ten samples were taken.

B-7 Showing (HEN 6)

Six grab samples (XR 13503-08) assaying between 2.09 and 6.75 g/t Au were taken from a lens of iron formation 2.5 km southeast along strike from the B-6 showing. Up to 35% pyrite and arsenopyrite with some banding are in amphibolite-rich iron formation to 4 m in width. There are both oxide and silicate facies.

Additional samples, taken along strike to the the north-northwest for 800 m, returned only one anomalous gold assay (2.09 g/t Au).

B-8 Showing (HEN 4)

Grab samples XR 15828, 15834 assayed 13.94 and 2.02 g/t Au from amphibolite and garnet amphibole rocks containing only minor sulphides. Numerous bands of iron formation, mainly oxide facies, up to 10 km wide are in the area, but are not auriferous. Similar oxide iron formations to the southeast in HEN 5 returned low gold assays. The area is structurally complex.

The Geological Survey of Canada (Thompson, 1986) mapped additional iron formation to the east of B-7, within the HEN 6 claim.

1985: A grid was established in the area with the greatest concentration of showings, mainly the HEN 1 claim. The base line extends from the south end of Arseno Lake to the north end of Ermine Lake (Fig. 8-4), with cross lines every 80 m. The entire grid was tested with a VLF EM survey (77 km) and areas underlain by lakes were tested by a magnetometer survey (35 km). Much of the grid was mapped at 1:2500 scale and 691 grab or chip samples were collected for assay.

The VLF and magnetometer survey show a strong anomaly extending more than 350 m south from the B-5 showing under the northern part of Arseno Lake (Fig. 8-4). VLF also gave a good response in the northwest part of the grid (west of Ermine Lake), but chip sampling returned only low gold assays.

Overall assay results from the 1984 showings were poor and failed to show economic potential for gold. The best showing (B-4, east of Unsafe Lake) covers a ridge of gold-bearing sulphide-rich iron formation with fairly consistent gold content, averaging 3.8 g/t Au and 0.3 m wide, over a 40 m strike length. Additional iron formation was identified and sampled in areas north and south of Ermine Lake, and northeast of Bras d'Or Lake.

A ninth gold showing B-58, near the HEN 3 - HEN 4 boundary, is a north-trending iron formation, 3-5 m wide and 100 m long. A composite grab sample assayed 9.6 g/t Au.

G&T, FOX and CHAR Claims

Silver Hart Mines Ltd.
5710 17th St.
Edmonton, Alta., T6P 1S4

Gold
76 J/11
66°42'18"N
107°26'30"W

REFERENCES

Roscoe *et al.* (1988); Schiller (1965); Thompson (1986); Thompson *et al.* (1986); Thorpe (1972).

DIAND assessment reports: 062214, 081819 (1984 work), 082653 (1987 work).

PROPERTY

G&T 1-6, FOX 1-6, CHAR 1-2.

LOCATION

The claims are near the Tinney Hills about 620 km northeasterly from Yellowknife. They extend south and east from the south end of Kathleen lake, which is about 8 km east of Bathurst Inlet (1-5 in Fig. 8-2).

HISTORY

The Main zone on the G&T claims was originally staked by Canadian Nickel Company in 1964 as the OX 1-10 group and were explored by trenching and by one packsack drill hole. During the same season Noel Avadluk prospected the area now contained within the CHAR 1 and CHAR 2 claims on behalf of Roberts Mining Co. (Schiller, 1965).

In 1967, Moresby Mines Ltd. and Trans-Canada Oils Ltd. restaked the lapsed OX group as the COT group. A total of 13 trenches were excavated and sampled. The assays ranged from a trace to maximum of 12.0 g/t Au across 0.27 m in Pit 5, 29.5 g/t Au across 0.61 m and 10.5 g/t Au across 3.35 m in Pit 4 (Thorpe, 1972, p. 110).

In 1982 and 1983, G. Warner restaked the area as the G&T 1-6 in the name of Bear Creek Hills Estate. In 1984, Silver Hart Mines Ltd. entered into an option agreement for the G&T claims and staked the adjoining FOX 1-3 and CHAR 1-2 claims. The FOX 4-6 were added in 1986.

In 1984, 457 m (7 holes) tested a 300 m section of iron formation in the "Main Zone", on G&T 2. Some of this work was submitted in DIAND assessment report 081819 and a summary of assays from these drill holes is given in Table 1 of DIAND assessment report 062214. The claims were mapped and prospected in 1984 and 1985.

Late in 1985, Silver Hart Mines Ltd. optioned the claims to Vanstate Resources Ltd. of Vancouver, but remained project operators.

DESCRIPTION

The area is underlain by Archean nodular schists and metasediments of the Yellowknife Supergroup (Thompson, 1986). These rocks are complexly folded and altered by low to high greenschist and retrograde metamorphism. West of the claims, these rocks are covered by Proterozoic sediments of the Goldburn Group (Fig. 8-2).

Amphibolitic silicate-, sulphide- and oxide-facies iron formations are similar to that found in the Lupin area, northern Contwoyto Lake, and the Pistol Lake area, on the west side of Bathurst Inlet (Roscoe *et al.*, 1988). One northwest-trending northwest-dipping band of iron formation has been traced in a southerly direction to the HEN claims, a distance of 30 km. It varies from 3 to 100 m in width and contains most of the important gold showings (Fig. 8-5). However, most of the iron formation in the area is less than 3 m thick and discontinuous.

Gold is found mainly in lenses of sulphide-facies iron formation. The highest and most consistent gold concentration is associated with a combination of wispy to banded pyrite and arsenopyrite, but the gold is erratically distributed. Sulphide-facies iron formation contains at least 5% sulphide minerals (pyrrhotite, pyrite and arsenopyrite); the remainder is mainly chlorite and hornblende, but also grunerite, quartz, garnet,

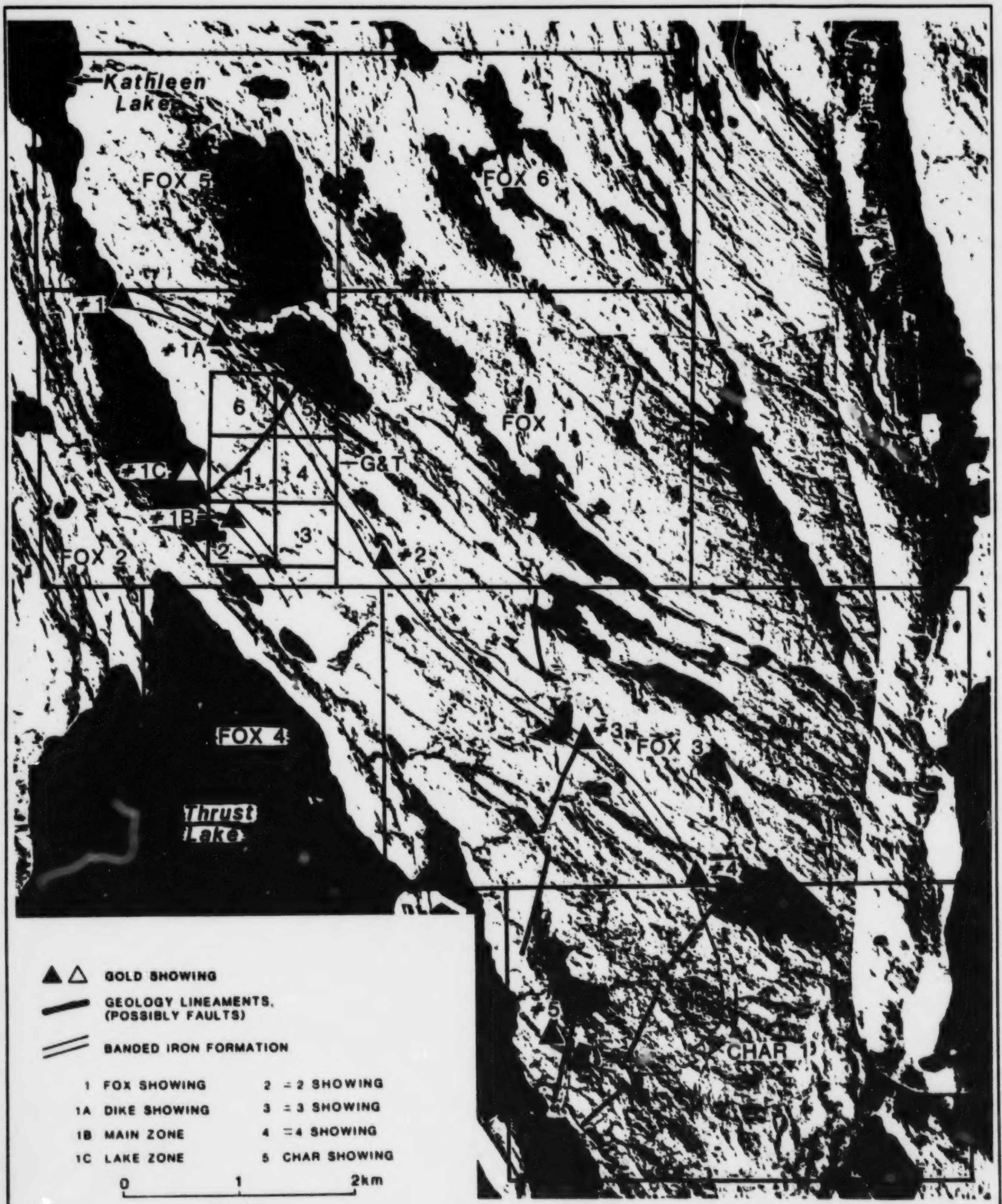

Kathleen Lake
FOX 5
FOX 6
#1
#1A
6
5
FOX 1
#1C
1
4
G&T
#1B
3
2
FOX 2
#2
FOX 4
Thrust Lake
#3
FOX 3
#4
#5
CHAR 1
GOLD SHOWING
GEOLOGY LINEAMENTS, (POSSIBLY FAULTS)
BANDED IRON FORMATION
1 FOX SHOWING
1A DIKE SHOWING
1B MAIN ZONE
1C LAKE ZONE
2 #2 SHOWING
3 #3 SHOWING
4 #4 SHOWING
5 CHAR SHOWING
0
1
2km
SCALE

FIGURE 8-5: Gold showings FOX and G&T claims, Kathleen lake, from DIAND assessment report 062214.

hedenbergite and at times magnetite. High sulphide zones are related to quartz veining and folding.

Drilling has been mainly in the Main zone, and its northwesterly extension, the Lake Zone (Fig. 8-5). This area, at the southeast end of Kathleen lake (Fig. 8-5), includes the original discovery. Hole 84-7 intersected 0.76 m of 11.0 g/t Au and 0.76 m of 4.5 g/t Au between 51.06 to 51.82 and 52.58 to 53.34 m (DIAND assessment report 062214). The results from holes 84-1 and 84-2 are shown in Figure 8-6.

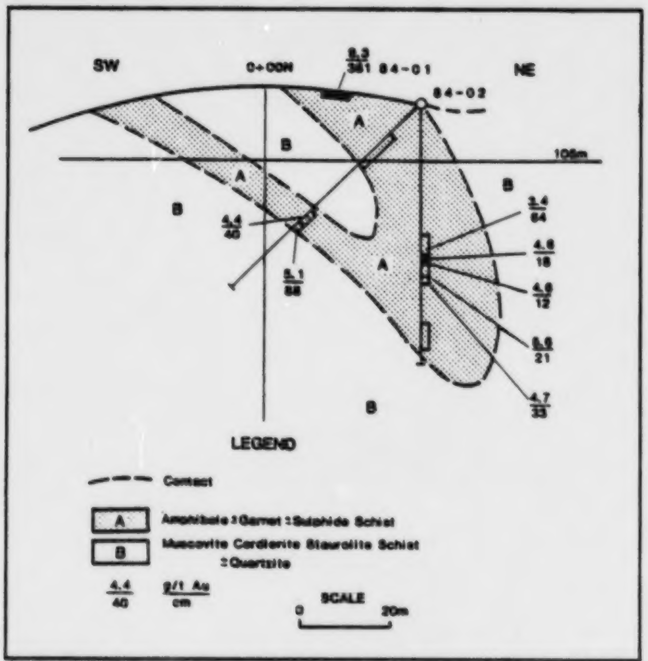


FIGURE 8-6: Cross section of main zone, G&T claims, Kathleen lake, from DIAND assessment report 062214.

CURRENT WORK AND RESULTS

1986: In 1986, Silver Hart Mines Ltd. did reconnaissance and detailed geological mapping, magnetometer and VLF surveying trenching and sampling. The area was flown with a DIGHEM system as part of a regional survey of all Silver Hart Ltd. claims in the Bathurst Inlet area.

In August and September, seven holes (365 m) tested the northwesterly extension of the Main zone. The best intersection, 11.97 g/t Au over 1.55 m, was in hole 86WP07 near the shore of Kathleen lake.

1987: In April, the magnetometer survey was extended northward on the ice of Kathleen lake. Iron formation was traced under Kathleen lake and the Proterozoic cover rocks.

Magnetic lows, possible sulphide-facies iron formation, along this trend were drill tested in May by 19 holes (1811 m) drilled from the ice of Kathleen lake. The first two holes, designed to extend the zone intersected in hole 86WP07, failed to intersect any significant zones of sulphide facies iron formation. However, several drill holes 300 to 500 m northwest of 86WO07 defined a zone of mineralized sulphide-facies iron formation. This zone has a strike length of 200 m, a down-dip extension of 100 m and widths up to 4.62 m. However, grades in this zone were low with a high assay of 3.98 g/t Au over 1.48 m.

The CHAR 1,2 and FOX 3 claims have lapsed.

HUNT CLAIMS

Echo Bay Mines Ltd. — Gold
354 Granville Sq. — 76 J/13,14
200 Granville St. — 66°51'-54'N
Vancouver, B.C., V6C 1S4 — 107°5'-35'W

REFERENCES

Fraser (1964); Thompson (1986); Thompson and Culshaw (1985); Thompson *et al.* (1985, 1986).
DIAND assessment report: 082589.

PROPERTY

HUNT 1-13 (10 300 ha).

LOCATION

The 13 HUNT claims are between latitude 66°51'N and 66°54'N and extend easterly from the Tinney Hills to the east side of central Gordon Bay (24-32 in Fig. 8-2). The area is 6 to 28 km east of Bathurst Inlet, 220 km northeast of the Lupin mine and 610 km northeast of Yellowknife.

HISTORY

The HUNT 1 and 2 claims were staked the fall of 1984, after obtaining favourable assays from reconnaissance sampling. Field work in 1985 prompted the staking of an additional 11 claims and several holes were drilled in the Lynn zone (HUNT 2) and Penny zone (HUNT 3) in the fall of 1985.

DESCRIPTION

The area was mapped at a regional scale by Fraser in 1964 at 1" to 8 miles. Thompson and Culshaw (1985) and Thompson (1986) mapped NTS areas 76 J and 76 I west 1/2 at 1:250 000 scale. Thompson and others (1985, 1986) noted several areas of quartz-amphibolite gossan that led to exploration in the area from 1984 to the present.

Outliers of Proterozoic Goldburn Group, Western River Formation quartzites, of the Kilohigok Basin are exposed in the westernmost claims (HUNT 11 and 12 - 32 in Fig. 8-2). The rest of the claims are underlain by a thick succession of highly-metamorphosed, Archean clastic sediments of the Yellowknife Supergroup.

Lenses and bands of iron formation within the clastic sequence host all of the gold showings. The iron formation is laterally extensive and thicknesses approach 60 m at some places. Tight, isoclinal folds are often developed. At least four separate gold bearing iron formations are recognizable. Gold is almost always associated with sulphide-rich iron formation. Detailed chip sampling and diamond drilling indicate that the sulphide-rich zones are closely associated with quartz veining and are extremely discontinuous along strike and down dip.

CURRENT WORK AND RESULTS

1984: Helicopter-supported rock sampling in 1984 revealed three areas of anomalous gold. They are identified as B9 (Lode Lake zone), and B10 and B11 (Lynn zone)(Fig. 8-7).

At B-9, silicate-, oxide-, and sulphide-facies iron formation are exposed over the apparent east-northeast strike of this showing.

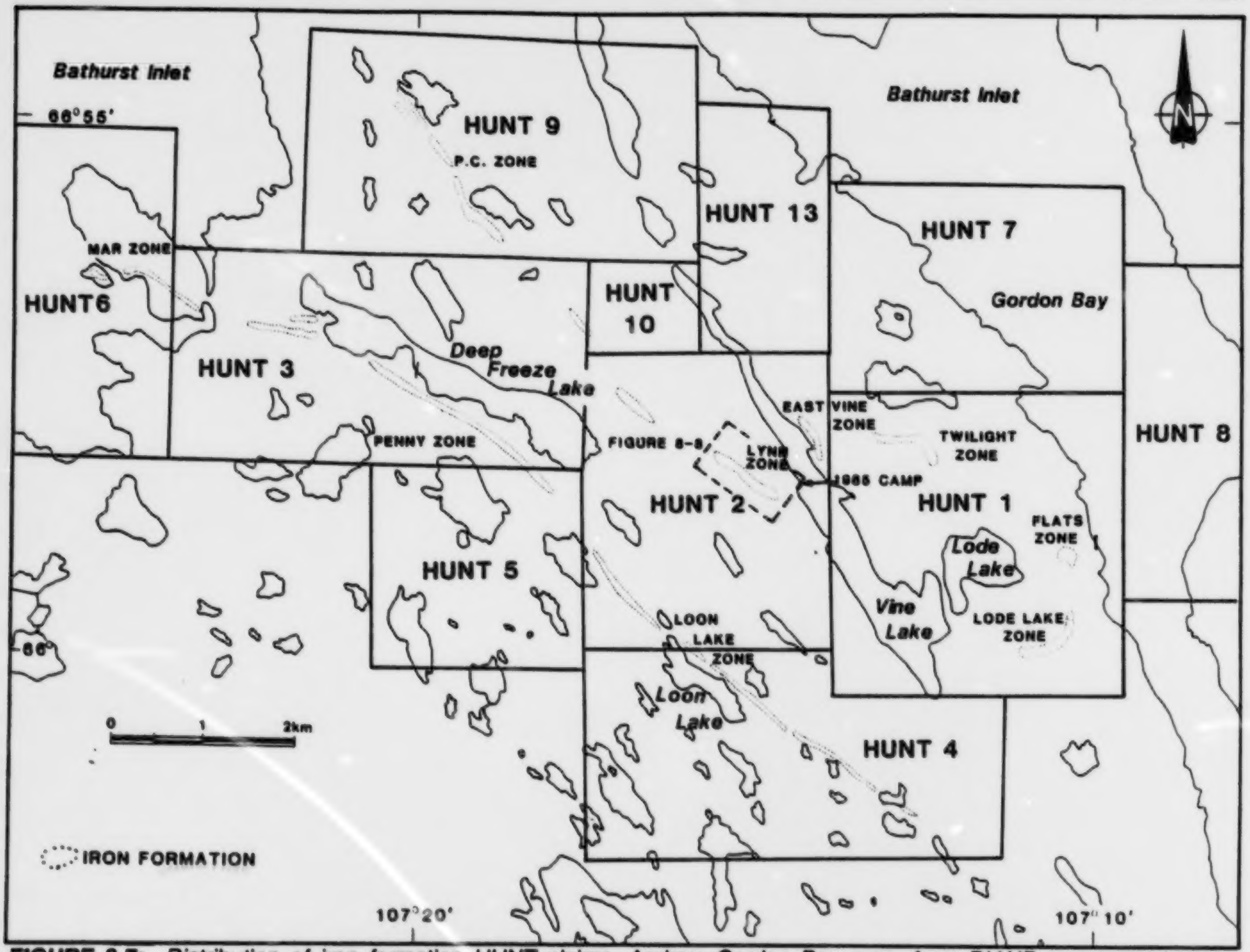

Bathurst Inlet
66°55'
HUNT 9
P.C. ZONE
Bathurst Inlet
N
HUNT 13
HUNT 7
MAR ZONE
HUNT6
HUNT 10
Gordon Bay
HUNT 3
Deep Freeze Lake
EAST
VINE ZONE
TWILIGHT ZONE
HUNT 8
PENNY ZONE
FIGURE 8-8
LYNN ZONE
1985 CAMP
HUNT 2
HUNT 1
FLATS ZONE
Lode Lake
HUNT 5
Vine Lake
LODE LAKE ZONE
LOON LAKE ZONE
66°
Loon Lake
0
1
2km
HUNT 4
IRON FORMATION
107°20'
107°10'

FIGURE 8-7: Distribution of iron formation HUNT claims, Andrew Gordon Bay area, from DIAND assessment report 082589.

Arsenopyrite is locally abundant and minor chalcopyrite was seen. Sulphide-facies iron formation, sample XR 15938 assayed 10.77 g/t Au over 0.25 m. Thirteen samples of complexly folded iron formation, which is up to 4 m wide, assayed from 0.07 to 10.77 g/t Au.

At B-10, grab sample XR 15735 of a 5 by 100 m lense of amphibolite assayed 12.27 g/t Au. The amphibolite contains pyrite (15-20%), pyrrhotite (5%) and arsenopyrite (5%) are all present.

1985: In the summer of 1985, 1305 samples were collected, numerous gold showings identified, and an additional 11 HUNT claims were staked (Tables 8-1 and 8-2; Figs. 8-2 and 8-7). Grids were established over the two most promising areas, the Lynn zone (HUNT 2) and the Penny zone (HUNT 3), and detailed geologic mapping, VLF EM and magnetic surveys were undertaken.

The Lynn zone (HUNT 2, Fig. 8-7) is an auriferous zone of iron formation, trending at Az 130° and dipping 65° to the northeast. The iron formation varies from 1 to 2 m wide in the south to as much as 40 m in tightly folded outcrops. A 10 m wide, unmineralized shear zone, trending Az 070° with dextral displacement, truncates the iron formation at two places on the grid. The 1:500 scale grid mapping distinguished the following mappable units: silicate-facies, sulphide-rich, sulphide-poor, and oxide-facies iron formation, biotite schist, biotite quartzite and diabase.

The strongest magnetic anomaly (up to 1600 gammas) is due to folded oxide-facies iron formation. The remaining anomalies are thought to represent thin bands of magnetite in sulphide-poor iron formation. The sulphide-rich iron formation does not give a significant magnetic response. A VLF EM conductor near the southeastern end of the grid may be due to a combination of conductive overburden and sheared bedrock. A 0.5 m wide shear zone with graphite was found in hole L-85-06 at 12 m depth.

TABLE 8-1: HUNT CLAIMS - 1985 sample distribution

CLAIM	ZONE	GRAB	CHIP	TOTAL
HUNT 1	Lode Lake + Flats	53	29	82
	Twilight	105	-	105
		2	2	4
HUNT 2	Lynn	216	136	352
	Loon Lake	35	30	65
	East Vine	24	6	30
HUNT 3	Penny	174	288	462
HUNT 4		18	-	18
HUNT 5		10	-	10
HUNT 6	Mar Zone	28	2	30
HUNT 7		18	2	20
HUNT 8		1	1	2
HUNT 9	P.C. Zone	32	2	34
HUNT 10				
HUNT 11				
HUNT 12		31	13	44
Miscellaneous Samples		44	-	44

TABLE 8-2: HUNT GOLD SHOWINGS AND ASSAY HIGHS

Zone	Strike Length	Average Thickness	High Grab	High Chip
Lynn	3.5 km	10 m	167.8	23.63/0.9 m
Penny	4.4 km	4-6 m	64.73	36.00/1.0 m
Lode Lake	800 m	2-3 m	35.49	5.14/1.3 m
Flats	200 m	4 m	13.7	9.60/1.2 m
East Vine	400 m	4-5 m	8.57	5.21/0.9 m
Twilight	800 m	2-3 m	17.45	-
P.C.	2 km	3-4 m	4.05	3.45/0.5 m
Mar	1 km	10 m	12.51	-
Hunt 12	800 m	10 m	10.46	-
Loon Lake	5 km	3 m	44.74	-

Two highly anomalous grab samples (168 and 121 g/t Au) were collected from sulphide-rich iron formation exposed along a cliff. Follow-up chip samples taken across of iron formation showed five areas of anomalous gold. Four of these areas were drilled. In all 656.9 m were drilled in 7 holes (Fig. 8-8). All seven holes intersected the Lynn zone iron formation over calculated true widths of 5 to 30 m. This iron formation is typically well-banded and predominantly silicate- and sulphide-poor facies. Mineralized sections are randomly distributed with no obvious alteration or structural relationship. Visible gold was observed in L-85-01 with arsenopyrite in a quartz vein, with a grunerite-rich band in L-85-02, and with chlorite and arsenopyrite in L-85-06. Intersections greater than 2 g/t Au are listed in Table 8-3.

Gold is concentrated in relatively thin sulphide-rich iron formation and quartz veining. The sporadic distribution of anomalous chip sample results and poor drilling results indicate lateral and vertical discontinuity of the mineralized zones.

The Penny zone (HUNT 3, Fig. 8-7) is a 40 to 80 m wide unit, containing several horizons of iron formation intercalated with clastic metasediments. It trends east southeasterly along the southern side of Deep Freeze Lake and dips about 50° to the north. This unit can be traced readily for more than 10 km, to the west it forms the Mar zone (HUNT 6) and to the east-southeast the Loon Lake zone (HUNT 2 and 4, Fig. 8-7). The southernmost iron formation is 3 to 7 m thick and forms a low, but fairly steep southward facing cliff along most of its length. This iron formation contains several gold showings. Gold assays greater than 2 g/t are mainly found in sulphide-rich iron formation. However, not all sulphide-rich iron formation contains anomalous gold, and sulphide-poor iron formation may have anomalous gold. Oxide and silicate-facies iron formation are present in the grid area as well.

A magnetic survey of the Penny grid helped to outline magnetic iron formation and diabase dykes.

Seven holes, totalling 556.2 m were drilled in the Penny zone iron formation. Mineralized sections in the Penny zone are within a silicified alteration zone. Visible gold was observed with arsenopyrite in sulphide-rich bands in holes P-85-01 and P-85-02. The best results are given in Table 8-3.

Several other zones were also identified by the 1985 reconnaissance sampling (Fig. 8-7; Tables 8-1 and 8-2). However, continuous chip sampling in the Lode Lake zone (B-9 zone of 1984), Loon Lake and P.C. zones failed to reproduce the anomalous results of grab samples and samples from three areas of a northeast-dipping iron formation in the Twilight zone (HUNT 1) gave anomalies assays for gold. A composite grab sample from the Mar zone (HUNT 6) assayed 12.51 g/t Au, but sulphide-rich iron formation is sporadic in this structurally complex area.

1986: In 1986 a small grid was set up on the Flats zone (HUNT 1), near the west shore of Gordon Bay (Fig. 8-7). Mainly sulphide-poor iron formation is interbedded with cordierite and andalusite-bearing metasediments. A 61,000 gamma magnetic anomaly corresponds to a fold nose in pyrrhotite and arsenopyrite-rich iron formation. This zone has very anomalous gold content, but the iron formations are thin and have low tonnage potential.

All but the HUNT 1 and 2 claims have lapsed.

TABLE 8-3: HUNT CLAIMS - 1985 Drilling Results (Intersections greater than 2 g/t Au)

D.D.H.	Interval (m)	Width (m)	Au (g/t)
Penny Zone			
P-85-01	51.21 - 53.08	1.87	2.02
	56.86 - 57.88	1.02	2.23
P-85-02	52.25 - 52.7	0.45	3.12
P-85-03	45.25 - 46.0	0.75	0.55
P-85-04	39.5 - 40.6	1.10	3.07
	45.0 - 45.75	0.75	3.94
P-85-05	78.3 - 78.9	0.60	2.06
P-85-06	41.6 - 42.15	0.55	8.26
	45.85 - 46.7	0.85	6.18
P-85-07	59.35 - 59.85	0.50	2.85
Lynn Zone			
L-85-01	27.15 - 30.0	2.85	9.12
incl.	27.15 - 27.8	0.65	29.48
	35.50 - 35.8	0.3	2.09
L-85-02	28.95 - 29.95	1.00	4.22
L-85-03	23.10 - 24.1	1.00	2.06
L-85-04	40.50 - 41.05	0.55	1.75
L-85-05	57.40 - 57.7	0.30	2.13
	59.85 - 62.8	2.95	4.74
L-85-06	26.50 - 57.9	1.40	3.08
L-85-07	34.60 - 35.6	1.00	6.82

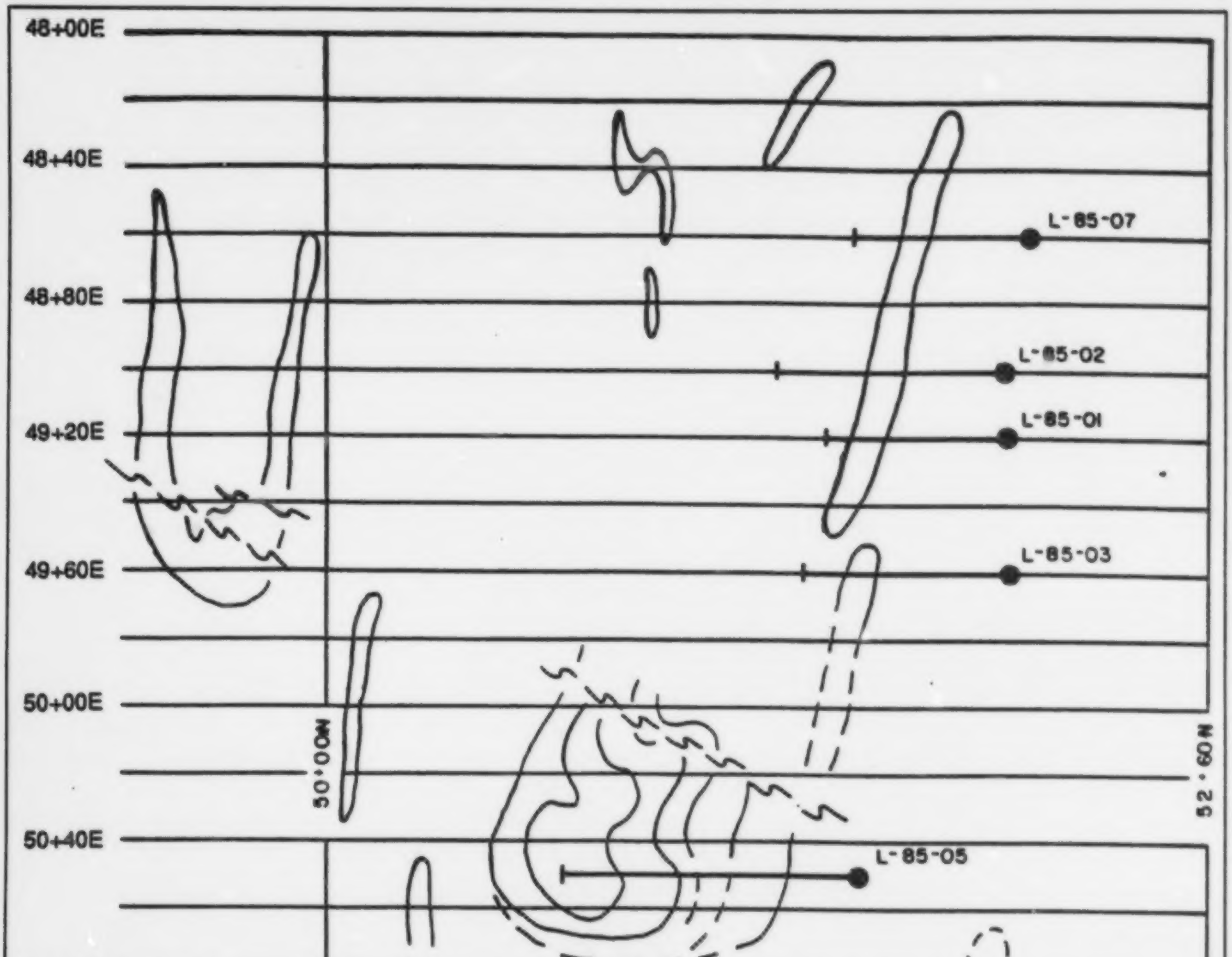

48+00E
48+40E
48+80E
49+20E
49+60E
50+00E
50+40E
50+80E
51+20E
51+60E
52+00E
50+00N
52+60N
L-85-07
L-85-02
L-85-01
L-85-03
L-85-05
L-85-04
L-85-06
LEGEND
1985 DRILL HOLE
SHEAR ZONE
SURFACE EXPRESSION OF IRON FORMATION
20
0
20
40
80
METRES

FIGURE 8-8: Lynn zone (HUNT 2) 1985 drill hole locations, from DIAND assessment report 082589.

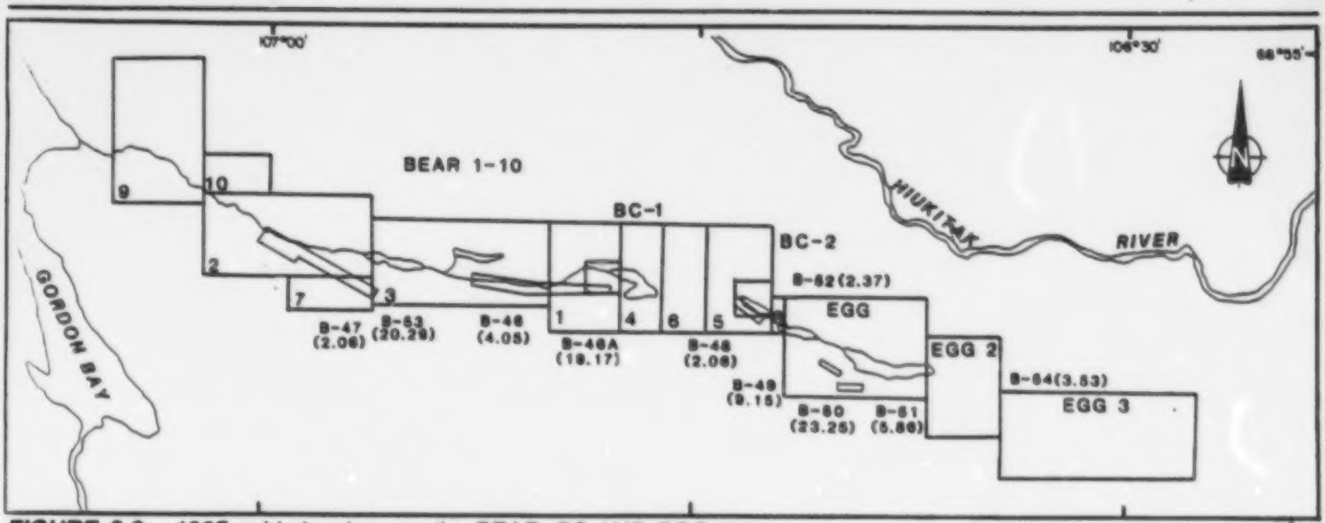


FIGURE 8-9: 1985 gold showings on the BEAR, BC AND EGG claims

BEAR AND EGG CLAIMS

Echo Bay Mines Ltd.
354 Granville Square
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
76 J/14-16
66°50-54'N,
106°30'-107°07'W

REFERENCES

Thompson (1986); Thompson *et al.* (1985, 1986).
DIAND assessment reports: 082557, 082558, 082559.

PROPERTY

BEAR 1-10 (4658 ha), EGG 1-3 (2465 ha).

LOCATION

The BEAR and EGG claims extend east-southeast from Gordon Bay, Bathurst Inlet for a distance of 30 km (Fig. 8-2, 15, 16 = EGG and 19-23, 25 = BEAR). They trend along the straight valley of 'Bear Creek' and adjoin the HUNT claims to the west and the LB and BL claims to the southeast.

HISTORY

Thompson (1986) mapped two quartz-garnet amphibolite gossans in 'Bear Creek valley'. These were staked by Bear Creek Hills Estate Ltd. as the BC 1 and 2 claims, recorded in March 1985. Helicopter traverses, by Echo Bay Mines Ltd. in late May 1984, led to the discovery of several additional gold showings in Bear Creek valley. The BEAR and EGG claims that cover the remainder of Bear Creek valley were recorded between July and October 1985 by Echo Bay Mines Ltd. of Edmonton.

DESCRIPTION

Thompson (1986) and Thompson and others (1985, 1986) mapped a migmatite isograd, roughly parallel to Bear Creek (Fig. 8-2), with sillimanite schist and gneiss to the south and sillimanite migmatite to the north.

Bear Creek valley is bounded by steep cliffs to the north and rugged slopes to the south. Relief up to 100 m is common in the valley. Gold is associated with lenses of sulphide-rich lenses of iron formation, which in turn is associated with quartz veins. Sulphides may be pyrrhotite, pyrite, arsenopyrite or loellingite. Some sulphide-poor iron formation also contains gold.

CURRENT WORK AND RESULTS

1985: Helicopter reconnaissance geochemical prospecting led to the identification of numerous gold showings along a belt of iron formation along the 'Bear Creek valley' and the BEAR and EGG claims were staked to protect the area (Fig. 8-9). Grids with 40 m spacing were set up over the main structures: the Falcon grid (BEAR 3 and 1), the Eagle grid (BEAR 3, 2 and 7 claims), the EGG main zone and EGG no. 2 on the EGG claim. Magnetometer surveys, 1:2000 scale mapping and phase II sampling were done on the grids.

Additional sampling returned assays of 18 and 24.34 g/t Au from the central Falcon grid and 42.9 g/t across 0.7 m, plus numerous grab samples above 20 g/t Au in the eastern part. A third area of interest within 200 m of the BC 1 claim produced assays up to 61 g/t Au.

Numerous samples collected along the entire length of the Eagle Grid (66°52'N, 107°W) assayed from 2 to 6 g/t Au. Higher results 10 to 30 g/t Au are associated with sulphides, which appear to be related to quartz veining. Anomalous gold was found 200 m west of the Eagle Grid and the zone probably continues westward under overburden.

Magnetometer surveys of the grids helped to establish the continuity of the iron formation in areas of overburden. Lower magnetic anomalies on the Eagle Grid are attributed to lower magnetite content in this area.

A second iron formation north of Bear Creek valley is not gold bearing. In all 720 grab or continuous chip samples were collected in phase I and II geochemical sampling.

Several other showings were identified and evaluated in 1985 (Fig. 8-9).

B-46: This showing corresponds to the Falcon Zone. A total of 163 samples were collected along this zone.

B-46A: This anomaly coincides with the eastern extension of the Falcon Zone onto Glen Warner's BC-1 claim. The first sample XR-9203 assayed 19.17 g/t Au. The iron formation trend across BC 1 is consistent with widths, strike lengths, and mineralization found in the Falcon Zone.

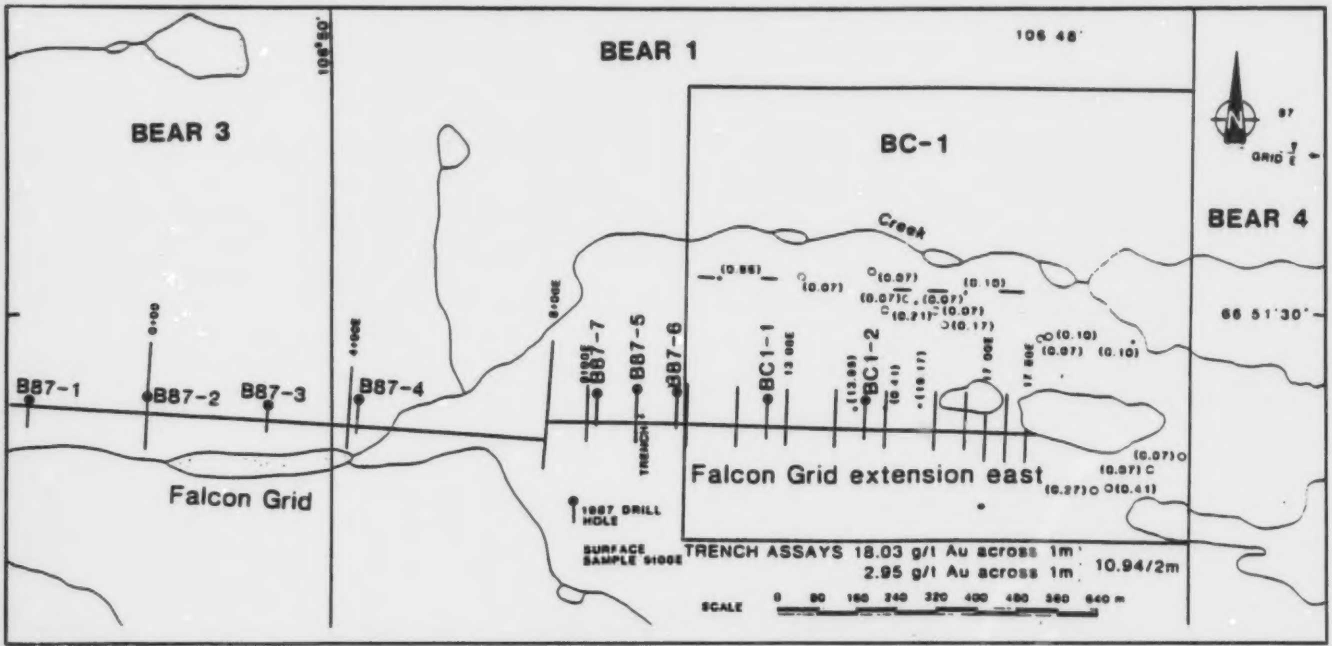


FIGURE 8-10: 1987 drill holes Falcon Grid (BEAR 1 and 3) claims and Falcon Grid extension east - BC 1 claim, from DIAND assessment report 082557.

B-47: This is predominantly an oxide/silicate iron formation which strikes for 1.5 km along the southern edge of the lake at the BEAR 2 and 3 boundary. Twenty-six samples were collected from this horizon which reached widths up to 3 m. Two initial samples assayed 2.0 to 2.5 g/t Au from the western portion. In the eastern portion, XR 19485 and 19490 were taken on a second pass from sulphide-rich lenses (pyrite and arsenopyrite) and assayed 2.40 and 4.73 g/t Au respectively. This could represent a western extension of the Falcon Zone.

B-48: This showing was discovered by helicopter traverse just west of Warner's BC 2 claim. Sample XR-14291 assayed 2.06 g/t Au. The iron formation is predominantly silicate/oxide in composition. There are trace sulphides in small lenses. Not much is known about its length or width.

B-49: This showing consists of several poddy iron formation lenses in the range of 1 to 2 m width and 5 to 15 m strike length. Samples XR-20303, 04 and 06 assayed 9.15, 3.98 and 3.36 g/t Au respectively. The lenses strike from BC 2 through BEAR 8 and onto the EGG claim.

B-50: This showing corresponds to "Zone 2" on the EGG claim. A well-exposed silicate- oxide-facies iron formation, with an average width of 2 to 3 m and well developed folding, strikes east-southeasterly for 700 m. Forty-nine samples were collected. Sample XR-20176 taken adjacent to a quartz vein with arsenopyrite assayed 11.01 g/t Au. Sample 20189 (21.36 g/t Au) was taken from float, and upon re-examination did not resemble the iron formation in bedrock. A baseline, 700 m long at A_z 107°, was set up.

B-51: This showing corresponds to the "Main zone" of the EGG claim. It is a 10 to 30 m wide zone of iron formation/quartzite gossan which stretches for 1.5 km and is readily visible from the air. Pyrrhotite and pyrite are common, ranging up to 20%. Approximately 75 samples are collected from various horizons within the zone. Samples XR-20231 and 33 assayed 2.78 and 5.66 g/t Au respectively. They come from a silicified pyrite-rich lens along the southern edge of the structure.

B 52: This showing is in discontinuous iron formation that trends into an oxide iron formation in the BC 2 claim. It is sulphide-poor iron formation with occasional pyrite-rich lenses. Of approximately 20 samples collected, only XR-20325 had an anomalous assay, 2.37 g/t Au.

B-53: This showing corresponds to the Eagle zone. A total of 202 samples was collected on this zone.

B-54: This showing is in very poorly exposed, southeasterly striking silicate iron formation in felsenmeer/boulders and outcrop. It has a length of 400 m and observed widths to 2 m. A total of 10 samples was collected. The high assay received was for sample XR-18906 (3.53 g/t Au), taken from a group of boulders/felsenmeer. Additional iron formation to the southeast contained very impressive sulphides locally. Strong shearing has occurred in this area and the possibility of north-striking trends are present as well.

1986: Areas of interest on the Falcon grid and the Falcon grid east extension were covered with fill-in magnetometer work. About 20 composite grab and continuous chip samples were collected. A trench was excavated 200 m west of the BC 1 claim. Samples from this trench assayed 18 and 2.6 g/t Au over 1 m. The highest gold content is related to sulphide-bearing iron formation.

Similar work was done on the EGG claim, but no work was done on the Eagle grid in 1986.

1987: In 1987 the BC 1 and 2 claims were optioned and the magnetometer, mapping and sampling was extended to cover this area.

Seven holes (455 m) were drilled on the Falcon grid and extension (BEAR 1 and 3) and two (142 m) on the BC 1 claim to test the gold potential of the iron formation at depth (Fig. 8-10). Three holes intersected narrow bands of sulphide-rich iron formation: B87-2 (7.54 g/t Au across 1.47 m), B87-4 (3.16 g/t Au across 2 m), and B87-5 (contains 5% sulphides with 5.97 g/t Au over 7.45 m including 30.8 g/t Au across 1 m). The other holes intersected very narrow zones of sulphide-poor iron formation or weakly mineralized migmatic schist.

BC 1 and 2 CLAIMS

Bear Creek Hills Estate
P.O. Box 820
Yellowknife, NWT, X1A 2N6

Gold
76 J/15
66°52'N
107°43' & 49'W

REFERENCES

Thompson (1986).
DIAND assessment report: 082557.

PROPERTY

BC 1 and 2.

LOCATION

The claims are centred on garnet-amphibolite-gossans (Thompson, 1986) and are 14 and 18 km east of Gordon Bay and 5 to 7 km south of the Hiukitak River (17 and 18 in Fig. 8-2).

HISTORY

The BC 1 and 2 claims were recorded in March 1985. In 1987 the claims were optioned to Echo Bay Mines Ltd.

DESCRIPTION

The BC 1 and 2 claims are underlain by gossans of iron formation (Thompson, 1986). The 1985 grab samples from BC 1 ranged up to 19.2 g/t Au.

CURRENT WORK AND RESULTS

1987: After the claims were optioned to Echo Bay Mines Ltd., the Falcon grid of the encircling BEAR 1 claim was extended eastward to include the southern half of the BC 1 claim. Another grid, the BC 2 grid was established in the southwestern portion of the BC 2 claim. Mapping and magnetometer surveys were done on these grids.

In late July, two holes (142 m) were drilled on the BC 1 claim (Fig. 8-10) to intersect iron formation below areas where surface grab samples and boulders of iron formation assayed in the range of 14.6 to 91.5 g/t Au. These holes intersected two units of iron formation. Hole BC 1-1 intersected 4.35 g/t Au over 1.0 m and hole BC 1-2 intersected 1.2 g/t Au over 1.15 m.

HOPE BAY VOLCANIC BELT

The Hope Bay volcanic belt (Fig. 8-11) is a steeply dipping syncline that extends at least 75 km S10°E from Hope Bay and averages 20 km in width (Fraser, 1964). It is a bimodal volcanic package of andesite pillow lava and felsic pyroclastic rocks. The lower two thirds of the section is dominated by andesite pillow lavas and metagabbro dykes and sills. The upper part or core of the syncline is characterized by a variety of felsic pyroclastic rocks with minor sediments (conglomerates, cherts, black shales, siltstones and reworked pyro-clastics) (Gibbins, 1987a,b). Near the top of the andesites, distinctive chocolate-brown weathering magnesium-rich komatiitic peridotites form sills that intrude the volcanic package in the areas northeast of Hope Bay (Gibbins and Hogarth, 1986).

The volume and diversity of felsic volcanics, as well as granite and felsite clasts in some of the conglomerates, suggest a granitic crust in the area at the time of volcanism. However, granites and granitic gneisses envelop the volcanic belt and generally appear to be younger.

Proterozoic topographic lows are indicated by outliers of basal Goulburn Group conglomerate and trough cross-bedded quartzite. Several large Franklin diabase dykes and sills form spectacular cliffs and ridges that dominate present-day topography, especially in the northern third of the belt.

The geology and mineral potential of the Hope Bay volcanic belt have been compared and contrasted with other Archean volcanic belts of the Slave Province and the Yilgaran block of Western Australia, as well as the well-documented Abitibi belt of the Superior Province. The north end of the belt is on tidewater and considered to have good potential for both precious and base metal deposits (Figs. 8-2 and 8-11).

Since 1964, the Hope Bay volcanic belt has been explored mainly for gold and silver, but also for base metals (Thorpe, 1966, 1972, pp. 110-120; Seaton, 1984, pp. 360-363; Seaton and Crux, 1985, pp. 307-315). Between 1973 and 1975, an estimated 3,900 kg of silver was produced from two high-grade veins near the northeast corner of the volcanic belt. (Padgham *et al.*, 1976, pp. 75-78; Gibbins *et al.*, 1977, pp. 227-228; Hurdle and Gibbins, 1978, p. 111; National Mineral Inventory).

In 1986, the author initiated 1:30 000 scale mapping of the northern Hope Bay volcanic belt (Gibbins, 1987a,b). The central and southern parts are to be mapped in 1988 and 1989. In 1987 and 1988, Abermin Corp. prospected gold-bearing shear zones in both greenstone and granite. This work resulted in the staking of several new claim blocks (Fig. 8-11).

HOPE BAY PROJECT

Abermin Corporation
Current owners:
CSA Management Ltd. and
Goldcorp Investments Ltd.
Toronto, Ont.

Gold
76 O/9,16; 77 A/3,6
68°09'N, 106°31'W

REFERENCES

Fraser (1964); Gibbins (1987a,b); Seaton (1984); Seaton and Crux (1985); Seaton and Hurdle (1979); Thorpe (1966, 1972).

DIAND assessment reports: 082611, 082639 and various other assessment reports for 77 A/3.

PROPERTY

Mineral Lease 2708 (RUS, WEL, VAN, CAT OX claims); WOG 1-3, WOIG 2, KOIG 1-8.
NOTE: the Wombat Showing and Ida Point Gold Showing are reported separately.

LOCATION

The claims are east of Hope Bay, between Roberts Lake and Ida Point and south of Hope Bay adjacent to the Koignuk River (Fig. 8-11). The area is 725 km northeast of Yellowknife and 125 km southwest of Cambridge Bay. Bay Chimo, a small Inuit community on Bathurst Inlet, is about 70 km southwest of Hope Bay.

HISTORY

Between 1964 and 1967, Roberts Mining Ltd. did considerable grass roots exploration in the Hope Bay volcanic belt, during which time they discovered and prospected several gold and silver showings (Thorpe, 1966, pp. 45-46 and 1972, pp. 110-120; Fig. 8-11). In 1967 the Hope Bay Syndicate, and later

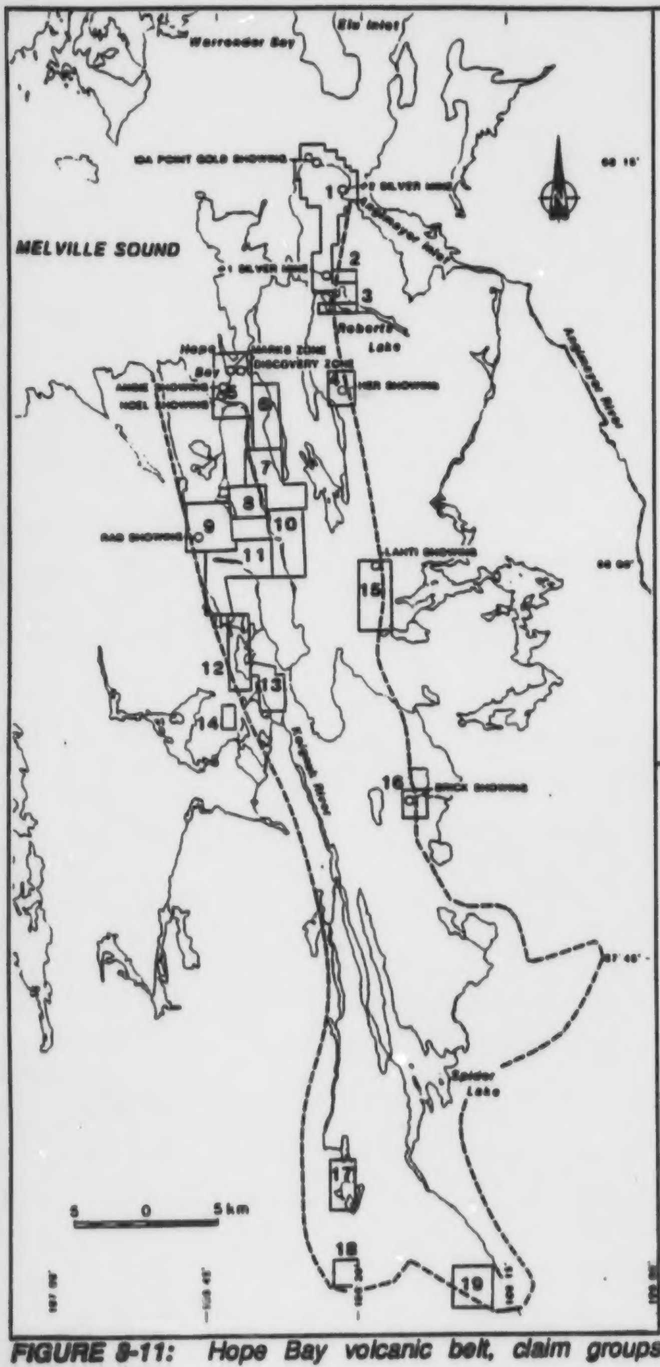


FIGURE 8-11: *Hope Bay volcanic belt, claim groups and showings.*

LEGEND

HOPE BAY VOLCANIC BELT

1	77A/3,6	MINERAL LEASE 2078	ABM
2	77A/3	WOG 1	ABM
3	77A/3	WOIG 2	ABM
4	77A/3	KOIG 2	ABM
5	77A/3	KOIG 1	ABM
6	77A/3	WOG 2	ABM
7	77A/3	KOIG 3,4	ABM
8	77A/3	WOG 3	ABM
9	77A/3	KOIG 5	ABM
10	77A/3,76O/15	COPE,DOK,LARK	NOR
11	77A/3,76O/15	BOK,BAK,CAN	IPM
12	76O/15	MEN,LYNX	IPM
13	76O/15	JON	IPM
14	76O/15	CHILL 1	NOR
15	76O/16	KOIG 6	ABM
16	76O/16	KOIG 7	ABM
17	76O/10	MERK 1,2	NOR
18	76O/10	SOU	NOR
19	76O/9	KOIG 8	ABM

ABM ABERMIN CORPORATION
NOR NORANDA EXPLORATION
IPM IDA POINT MINERALS

a series of successor companies, optioned the Hope Bay claims and drilled the more encouraging showings. Efforts were concentrated on two silver discoveries near Roberts Lake and Angimayor Inlet. An estimated 3,900 kg of silver was mined between 1973 and 1975.

In 1981, both Noranda Exploration Ltd. and Ida Point Minerals Ltd. had regional exploration programs in the area (Seaton, 1984, pp. 360-363). Noranda Exploration Co. Ltd. flew an Input (EM and magnetic) survey of the volcanic belt, and both groups staked numerous claim blocks.

During 1982-83 Noranda Exploration Co. Ltd. optioned the Ida Point Minerals/Lynx Canada Exploration Ltd. claims, established grids in favourable areas and did detailed geophysical surveys (Seaton and Crux, 1985, pp. 307-315). This work was directed mainly to the discovery of massive sulphide deposits.

Early in 1987 an interest in the Roberts Mining Co. mineral leases was optioned to Abermin Corporation. In addition, the KOIG 1-8 claims were staked to protect gold showings on open ground.

DESCRIPTION

The geology of the Hope Bay volcanic belt was described in the introduction to this section. Descriptions of individual showings are given in Thorpe (1966, 1972) and appropriate assessment reports. Most of the showings are indicated in Figure 8-11.

CURRENT WORK AND RESULTS

The objective of the 1987 field season was to evaluate the northern part of the Hope Bay volcanic belt where previous prospecting was concentrated and the exposure is best. This area includes the Roberts Lake mining lease, containing two former silver producing zones (#1 and #2, Fig. 8-11). The work included resampling all gold showings and prospecting for extensions and other mineralized zones. Several mineralized areas were identified, but most of the detailed work was done at the Wombat showing and the Ida Point gold showing, which are described in separate write-ups.

In addition to work on these showings, the areas north and south of the Wombat zone were prospected and sampled. The majority of samples were well-mineralized, but very little gold was found.

Discovery Zone: 68°06'40"N, 106°42'25"W

This zone is 2.3 km north of the rapids at the mouth of the Koignuk River. The showing was discovered by Roberts Mining Ltd. in the fall of 1964 and several trenches were excavated and sampled in the sixties. It is in a major shear zone estimated to be at least 300 m wide and traceable for 0.6 km along the regional north-trending strike of the volcanic country rocks. Gold is associated with a narrow (5 cm to 1 m wide), massive arsenopyrite-rich "vein" in the rusty shear.

Abermin Corporation's 1987 work extended the zone southwards for several hundred metres. The gold content of samples is moderately anomalous, ranging from 2 ppb to 15 g/t Au, and 0.02 to 17.2 g/t Ag. Arsenic content is highly anomalous and ranges from 25 ppm to 28%, but base metals (copper, lead and zinc) are low. A VLF EM-16 survey did not clearly define the arsenopyrite-rich structure, but numerous conductors were identified.

Her Showing: 68°06'30"N, 106°31'27"W

The Her Showing is on the eastern margin of the volcanic belt near the centre of KOIG 2 or 11 km south of Roberts Lake. In 1987 Abermin Corporation resampled pits, did a VLF EM-16 survey and prospected the surrounding area. Rock samples ranging from 46 ppb to 40.7 g/t Au and 0.87 to 665 g/t Ag are considered encouraging. Arsenic and base metal contents are low.

Two strong VLF EM conductors were recognized, but they do not appear to be related to the showing.

Lahti Showing: 68°00'N, 106°27'30"W

The Lahti Showing is in the northern portion of the KOIG 6 claim, near the intersection of 68°N and the eastern margin of the volcanic belt. The showing was explored by Perry River Nickel Mines Ltd. in 1976 (Seaton and Hurdle, 1979 p. 89). Abermin Corporation's 1987 assays range from 1.66 to 64.1 g/t Au and 2.3 to 69.7 g/t Ag.

Mark's Showing: 68°07'N, 106°44'W

In August 1987, Abermin Corporation geologist M. Hiltz discovered a new showing 1.0 km to the northwest of the Discovery zone at the base of the large peninsula jutting out into Hope Bay. This showing is a gossanous zone ranging from 0.3 to 1.0 m in width including a 0.13 m wide tabular quartz vein. The zone strikes at Az 176° to 210° and dips from 42° to 85°W and is exposed along strike for at least 40 m. The vein system is well mineralized carrying from 10 to 70% arsenopyrite, 10 to 60% pyrite, up to 5% iron-carbonate and 20 to 65% quartz. All samples from this showing were selected grab samples.

Assays for rocks collected from this zone range from 86 ppb to 7.24 g/t Au with 6 of the 10 rocks collected returning 7 g/t Au or better. Silver assays range from 2.30 ppm to 39.0 g/t giving this zone an average Au/Ag ratio of 0.66:1, comparable to the Lahti Showing at 0.87:1. Lead and zinc content is low with maximum assays being 137 ppm Pd and 330 ppm Zn. Copper is moderately anomalous returning assays ranging from 34 to 6200 ppm (0.62%). As expected arsenic assays are extremely high ranging from 643 ppm to 16.6%. No panned concentrates were collected at this location.

Rad Showing: 68°01'10"N, 106°46'51"W

This showing is in the southwest quarter of the KOIG 5 claim, near the western margin of the Hope Bay volcanic belt. It has been described as "a small but relatively high grade gold vein" (Thorpe, 1972, p. 117).

Abermin Corporation's assays for 7 samples ranged from 34 ppb to 29 g/t Au and 0.06 to 7.0 g/t Ag. The vein is considered too small to be economically significant, but it may be related to a large east-trending fault on the claim.

The Brick, Lahtal South and Kennet Tarn-South showings and rusty carbonate shear zones east of the lower Koignuk River were also sampled.

At the end of the 1987 field season, the WOG 1 and WOIG 2 claims were staked to extend mineral holdings in the vicinity of the Wombat zone at Roberts Lake. The WOG 2 and 3 were staked near Hope Bay to protect the 'Discovery Zone'.

WOMBAT (GRANITE) SHOWING

Abermin Corporation	Gold, Silver, Copper
Current owners:	77 A/3
CSA Management Ltd. and	68°10'12"N, 106°31'W
Goldcorp Investments Ltd.	
Toronto, Ont.	

REFERENCES

Fraser (1964); Thorpe (1972).
DIAND assessment report: 082611.

PROPERTY

Mineral Lease 2708 (WEL 1-7, CAT 1-4); WOG 1; WOIG 2.

LOCATION

The Wombat showing is on the north shore of Roberts Lake, just east of the entrance to a large circular bay. It is in the WEL 3 claim, 2 km southeast of the Roberts Lake or the Number 1 silver deposit (Fig. 8-11).

HISTORY

This showing was known as the 'granite showing' prior to 1987. It was trenched, mapped at 1:600 scale, and sampled by Roberts Mining in 1966. In 1967, it was mapped at 1:240 scale and resampled by the Hope Bay Syndicate. The best assays ranged from 15.1 to 100 g/t Au and 7.54 to 48.0 g/t Ag over 0.4 to 1.3 m (Thorpe, 1972, p. 115).

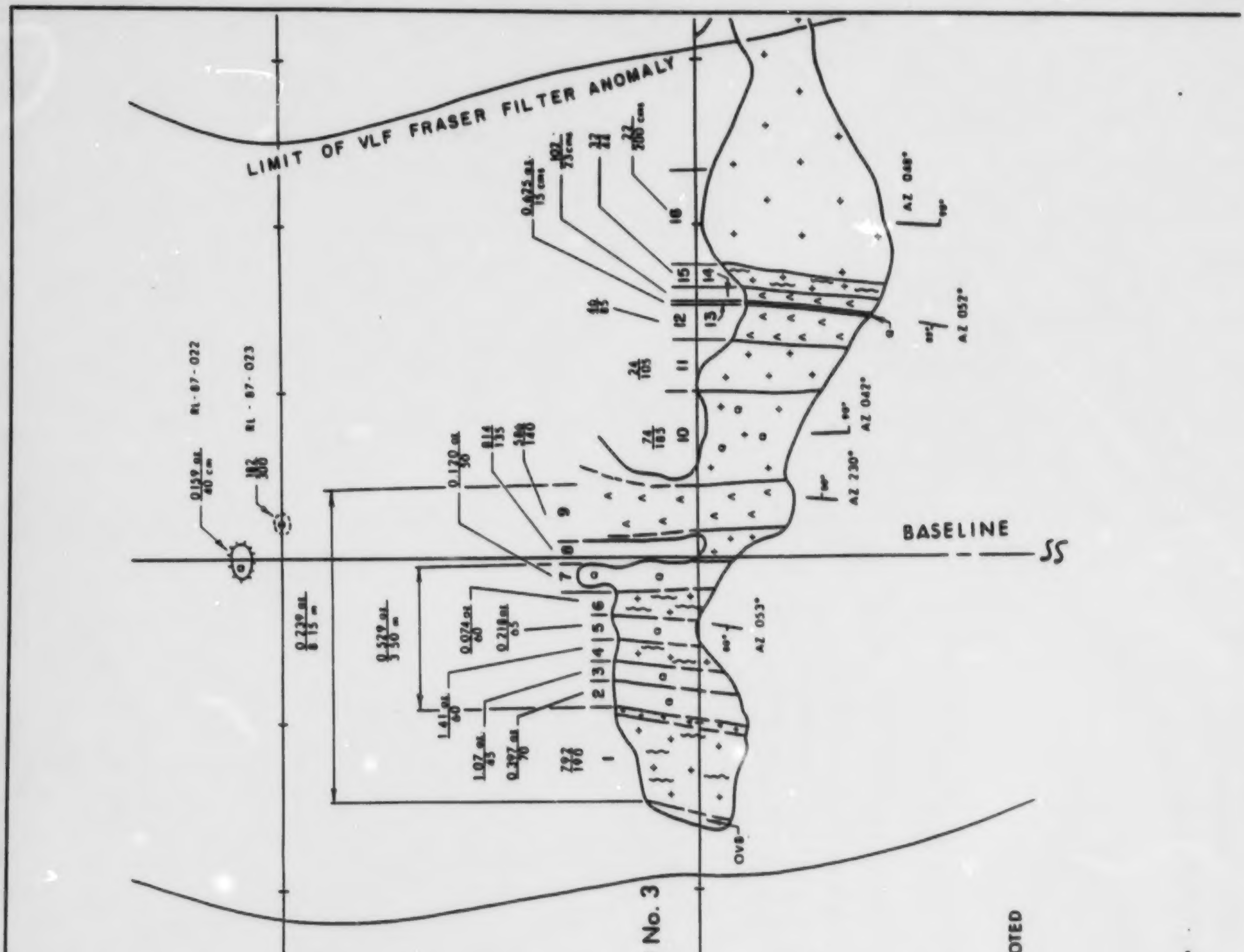
DESCRIPTION

The Wombat zone is in a prominent linear structure or shear zone that trends at Az 040°, varies from 2 to 12 m in length. The zone itself consists of quartz veins, granite and shattered granite plus unmineralized mafic dykes or schistose greenstone remnants, which are replaced by ferruginous carbonate. The country rock is fresh granite or granodiorite (Fraser, 1964). The veins and breccia contain minor pyrite and chalcopyrite and visible gold has been panned out of the crushed vein material.

CURRENT WORK AND RESULTS

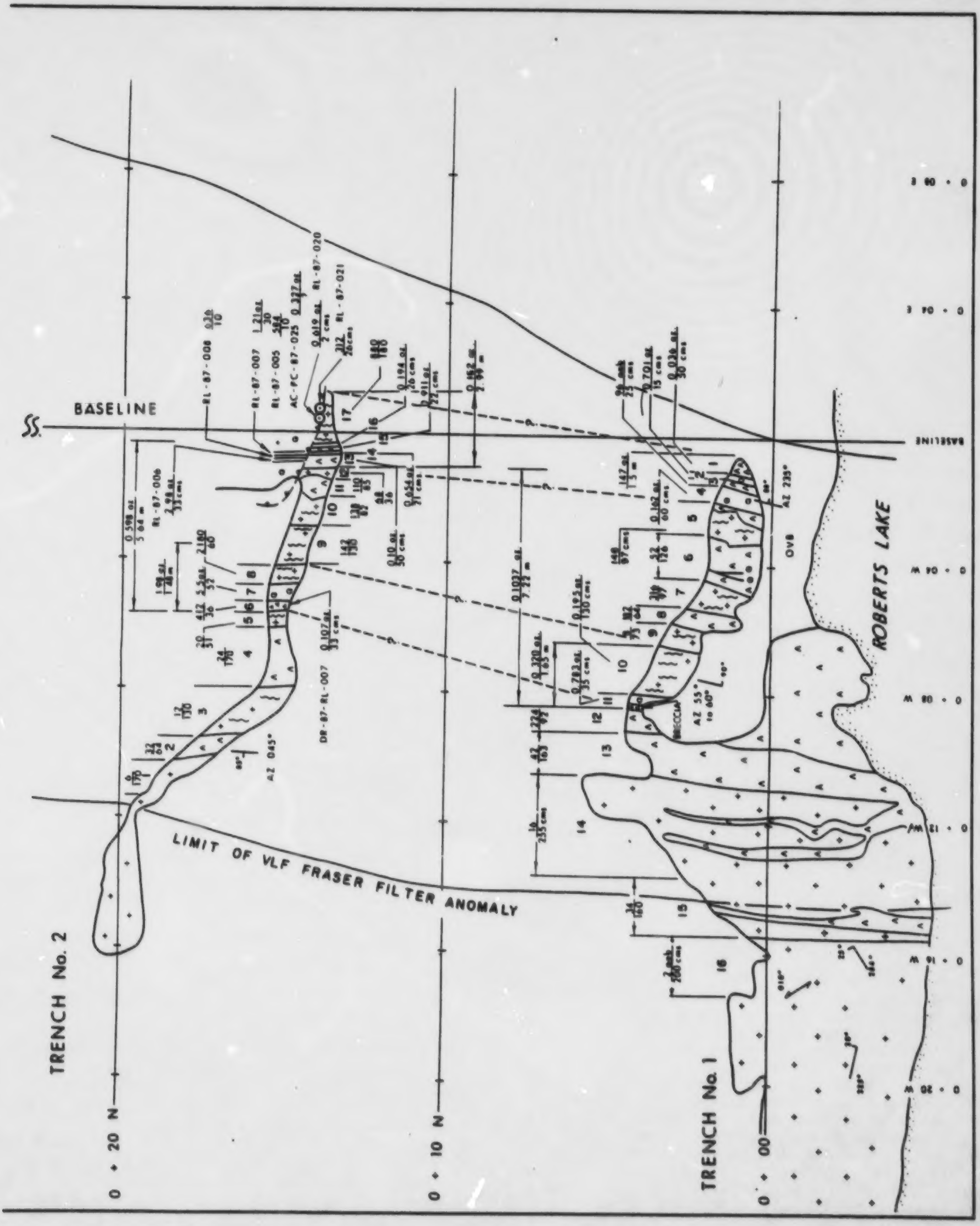
A 500 by 80 m grid was established along the Wombat shear zone and the geology was mapped in detail. Chip samples showed favourable results: 3.2 m width of 11.6 g/t Au. Consequently, it was decided in mid-July that extensive trenching and sampling were warranted.

This second round of sampling was even more encouraging that the first. At trench 3, where the first samples were collected, a comparable series of samples assayed 18.2 g/t Au and 4.46 g/t Ag over 3.50 m. At trench 2, 35 m to the south, a 1.48 m interval assayed 67.9 g/t Au. It is seperated from a second zone of 2.93 m of 5.6 g/t Au, by 2.97 m of weakly mineralized rock. At trench 1, a further 13 m south, two similar zones give a combined zone 7.22 m of 3.57 g/t Au. The gold to silver ratio of more than 40 samples averages a relatively constant 3:4. Several other promising zones were also found on the grid. Assays for trenches 1-3 are shown in Figure 8-12.



LIMIT OF VLF FRASER FILTER ANOMALY
TRENCH No. 3
BASELINE
55
0 + 60 N
0 + 50 N
RL-87-022
RL-87-023
OVB
AZ 053°
AZ 230°
AZ 042°
AZ 052°
AZ 048°
N
LEGEND
QUARTZ VEIN
IRON CARBONATE ALTERED MAFIC DYKE
SHATTERED GRANITE
GRANITE
SYMBOLS
GEOLOGICAL CONTACT (DEFINED, ASSUMED)
CONTINUOUS CHIP SAMPLE INTERVAL AND NUMBER WITH PREFIX WB-T3
GRADE-ppb/ WIDTH-m, GRADE IN oz. WHERE NOTED
OVERBURDEN
SAMPLE LOCATION SITE WITH ASSAY VALUES AND WIDTHS
JOINTS WITH DIPS,
FOLIATION DIRECTION WITH DIP
0
2
4
6
8
10 m

FIGURE 8-12: Wombat zone with trenches and sample sites, from DIAND assessment report 082611.


TRENCH No. 2
TRENCH No. 1
BASELINE
LIMIT OF VLF FRASER FILTER ANOMALY
ROBERTS LAKE
0 + 20 N
0 + 10 N
0 + 00
0 + 08 E
0 + 04 E
0 + 04 W
0 + 08 W
0 + 12 W
0 + 16 W
0 + 20 W
RL-87-008
RL-87-007
RL-87-005
AC-PC-87-025
RL-87-020
RL-87-021
RL-87-006
DR-87-RL-007
AZ 045°
AZ 55° to 60°
AZ 235°
BRECCIA
OVB

In the Wombat shear zone, gold is continuous over at least 50 m and is open at depth and to the south under Roberts Lake.

Contoured VLF Fraser filter data and VLF profiles clearly show a weak but identifiable linear conductor, corresponding to the Wombat zone. In addition, several other conductors were outlined along the structure and elsewhere on the grid.

An orientation geochemical survey, of humus samples, demonstrated a strong correlation between gold and silver (Au:Ag = 3.3:1). Gold concentrations do not correlate with arsenic or copper enrichment, however the highest gold, arsenic and copper concentrations are all associated with quartz-rich material. There appears to be little or no correlation between gold and lead or zinc.

IDA POINT GOLD SHOWING

Abermin Corporation
Current owners:
CSA Management Ltd. and
Goldcorp Investments Ltd.
Toronto, Ont.

Gold, Silver
77 A/6
68°15'12"N, 106°34'W

REFERENCES

Thorpe (1972).
DIAND assessment report: 062611.

PROPERTY

RUS 1-4, part of mining lease 2708.

LOCATION

The Ida Point gold showing is 0.5 km southeast of the northern tip of Ida Point or 3 km northwest of the Number 2 or Ida Point silver mine (Fig. 8-11).

HISTORY

Numerous auriferous veins are reputed to have been discovered and staked by Archie Talbot and Ingie Bjornson, prospectors in the employ of Roberts Mining Ltd, in July 1966.

In 1967, the Hope Bay Syndicate optioned the property and excavated several pits, collected numerous samples and drilled 17 holes (165 m). Results were inconclusive to discouraging as the shallow drilling indicated that the quartz lenses containing the best gold are very irregular and discontinuous.

In 1980-81, Lynx Canada Exploration Ltd. optioned the claims from Ida Point Minerals and retained Derry Mitchener & Booth Consultants to explore the area.

DESCRIPTION

The showings are of gold-bearing quartz veins along shears in greenstone and to a lesser extent disseminated minerals in shears (Thorpe, 1972, p. 111). The volcanic rocks have been cut by shears in random directions. Some shears have been traced for up to 300 m, although displacement by crosscutting shears makes continuity conjectural in some cases.

> The shear zones generally are host to quartz veins ranging up to about 10 feet in width. A number of the veins consist of fine-grained sugary white quartz with arsenopyrite-rich bands along their margins. In part the arsenopyrite is very fine grained and in part it is in small needle-like prismatic crystals. The arsenopyrite probably carries most of the gold values where the veins are narrow, but in the wider veins small specks of visible gold are common in this type of quartz. The arsenopyrite bands along the vein margins have in some cases formed by partial replacement of the sheared wall-rock. (Thorpe, 1972, p. 111)

CURRENT WORK AND RESULTS

In 1987, Abermin Corporation geologists resampled several pits and panned material from highly altered shear zones. In general gold content was high (up to 45 g/t), but silver was low, averaging less than one tenth the gold content. Pan concentrates ranged from 13.2 g/t to 1481 g/t Au. Arsenic in these concentrates is also high (0.19% to 11.1%), but copper, lead and zinc content is generally low.

Systematic sampling, mapping, magnetometer, VLF EM and geochemical surveys are recommended in order to identify new drill targets.

HIGH LAKE SUPRACRUSTAL BELT

The High Lake supracrustal belt (Easton *et al.*, 1982) is part of a northerly trending complex of mainly volcanic rocks, intruded to the west by extensive granitic plutons and flanked to the east by volcaniclastic, carbonate and turbidite sediments, and intrusive granitoid rocks.

HOOD PROPERTY

Cominco Ltd.
Suite 700, 409 Granville St.
Vancouver, B.C., V6C 1T2

Gold
76 L/10
66°30'-66°37'30"N
110°30'-110°59'W

REFERENCES

Fraser (1964); Jackson *et al.* (1986b); Seaton (1978).

DIAND assessment reports: 018788, 019502, 060671, 060819, 061345, 061407, 061408, 061873, 082096.

PROPERTY

SGJV 1; Prospecting Permit 1031; VER 1-4.

LOCATION

The property is 485 km northeasterly of Yellowknife, and 35 km north of Kathawachaga Lake. The northern boundary of Prospecting Permit 1031 is 25 km south of the Hood River.

HISTORY

Documented exploration by mining companies of the 76 L/10 area started in 1968. Exploration by Borealis Exploration Ltd. in 1968 and 1969 and later by Long Lac Mineral Exploration Ltd. as Prospecting Permit 337 in 1974 and 1975 (Seaton, 1978) is reported in DIAND assessment reports 018788, 019502, 060671, 060819, 061345, 061407, 061408, 061873. Work included geological mapping at 1:31 680 and locally at larger, more detailed scales, a helicopter-borne EM, magnetometer and radiometric survey, fixed wing AEM and magnetometer (Input surveys), and prospecting. Though samples were, in most cases, assayed for gold as well as silver, zinc and copper, emphasis was on exploration for massive sulphide. Long Lac Mineral Exploration was the first to discover gold in the property area (DIAND assessment report 061345). Apart from a brief re-evaluation of the southern part of 76 L/10 by Noranda Exploration Company Ltd., no work was done in the property area until the mid-1980's when auriferous iron formation became the primary exploration target. Following one day of prospecting, Trigg Woollett Olson Consulting Ltd. recorded SGJV 1 for the Slave Gold Joint Venture in

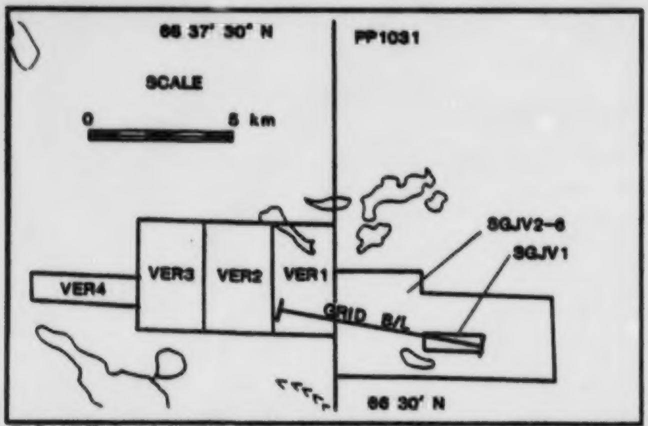


FIGURE 8-13: SGJV and VER claims and Prospecting Permit 1031 claims and grid.

September 1984 to cover a gold showing and were granted Prospecting Permit 1031 in February 1985. In November 1985, Cominco Limited recorded VER 1-4, and in September 1987, SGJV 2-6 to secure parts of Prospecting Permit 1031 which lapsed in 1988. SGJV 1, Prospecting Permit 1031 were optioned by Cominco in early 1986 from the Slave Gold Joint Venture. Cominco abandoned their option in 1987. By 1988 VER 1 and 2 (Fig. 8-13) had lapsed.

DESCRIPTION

As part of a widespread reconnaissance between 65°N and 69°N, 100°W and 112°W, Fraser (1964) mapped the property area at 1:506 880. This helicopter reconnaissance was the first published geological mapping covering 76 L/10. The Hood Property is mainly underlain by mafic intermediate and felsic volcanics, Yellowknife Supergroup metasediments and granitic, locally pegmatitic intrusive rocks. All except the northeastern part of 76 L/10, which is underlain by granitic rocks, was mapped at 1:63 360 by Johnson and Robinson in 1974 (DIAND assessment report 081345) for Long Lac Mineral Exploration. Jackson and others (1986b) mapped 76 L/10 at 1:30 000. On the Hood Property bedding and schistosity have a westerly to northwesterly trend. Northwesterly trends are in the northwestern part of the property where the strike is transitional to northerly (outside the property) and in the eastern part of the property where a tight fold with a northwesterly striking axial plane has been mapped (DIAND assessment report 081345). Metasediments locally contain cordierite and garnet. Units of silicate and sulphidic amphibolitic iron formation and of graphitic argillite have been mapped on the property. Volcanics and overlying sediments young generally to the south.

CURRENT WORK AND RESULTS

In 1986 a grid was constructed, with an 8-km-long baseline extending west-northwesterly from the south-central part of Prospecting Permit 1031 and the SGJV 1 claim to the southern part of the VER 1 claim (Fig. 8-13). The grid was geologically mapped at 1:5000. Six iron formation-hosted gold showings were mapped, of which four (Nos. 1,2,5,6 showings) in the eastern part of the grid (on the SGJV 1 claim) were selected for detailed work. This included 1:2 500 geological mapping of that part of the grid covering the four eastern showings and 1:500 mapping of the complexly folded No. 1 showing. Magnetometer and horizontal loop EM over the four eastern showings showed each to coincide with weak conductors and locally magnetic anomalies. Northwesterly trending diabase dykes also give rise to magnetic features.

In 1987 gold showings on SGJV 1 were tested by eight diamond drill holes totalling 607 m.

BLACKRIDGE AND BR CLAIMS

Aber Resources Ltd.	Gold
700, 1177 W. Hastings St.	76 L/15
Vancouver, B.C., V6E 2K3	66°52'N, 110°52'W

REFERENCES

Fraser (1964); Jackson *et al.* (1986b); Seaton *et al.* (1987).

DIAND assessment reports: 018788, 019502, 060671, 060819, 061408, 061873, 082273.

PROPERTY

BLACKRIDGE 1; BR 1, 2.

LOCATION

The property is roughly 520 km north-northeasterly of Yellowknife and 3 km northwest of the Hood River.

HISTORY

BLACKRIDGE 1 was recorded in September 1983 and BR 1 and 2 in October 1985. Borealis Exploration Ltd., which explored NTS area 76 L/15 from 1965 to 1970, by airborne and ground geophysical surveys, discovered and trenched the gold showing currently staked as BLACKRIDGE 1 (DIAND assessment reports: 018788, 019502, 060671, 060819, 061408, 061873). Noranda Exploration Company did airborne geophysics and ground follow-up over the area in 1981.

DESCRIPTION

The claims are in the southern part of the High Lake supracrustal belt. The area was mapped at 1:506 880 as part of a widespread geological reconnaissance by Fraser (1964). More recently the area has been mapped at 1:50 000 by Jackson and others (1986b), who show the property area to be underlain by north-northeasterly striking greywacke/sandstone of greenschist facies and their amphibolite-grade equivalents in the northwestern part of the claim block. In the northwestern part of the property the sediments contain abundant amphibolite layers and are cut by a sill-like body of massive amphibolite, to the northwest of which metasediments and pillowed mafic volcanics outcrop (Fig. 8-14).

CURRENT WORK AND RESULTS

A grid was constructed in the central part of the BLACKRIDGE 1 claim with a north-northeasterly baseline 600 m long and roughly coincident with the contact between gabbro, presumably the massive amphibolite mapped by Jackson and others (1986b), and a belt of recessive, largely overburden-covered metasediments. Bedding in the metasediments dips steeply to the southeast as does foliation in both gabbro and sediments (DIAND assessment report 082273).

In 1985 an altered and locally brecciated zone within gabbro (amphibolite) or at the metasediment-gabbro contact was tested

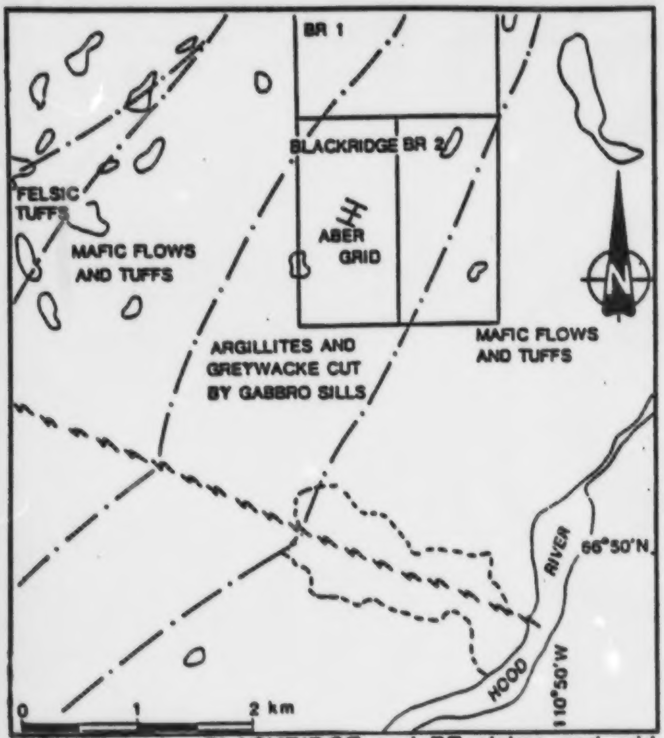


FIGURE 8-14: BLACKRIDGE and BR claims and grid. Geology, from DIAND assessment report 082273.

by six diamond drill holes. Alteration, including silicification, chloritization and carbonatization, together with increased biotite and amphiboles, is accompanied by concentrations of arsenopyrite, pyrite, pyrrhotite and locally gold. The best drill intersection assayed 11.4 g/t Au across 1.07 m, from an arsenopyrite- and pyrite-rich zone in gabbro.

Metasediments penetrated in drilling were hornfels and phyllite.

WILBERFORCE BASIN

The "Wilberforce Basin" is an irregularly shaped area of metasediments extending from the James River in the north across the Hood River, to the Booth River in the south. Wilberforce Falls lies just east of, and outside, the area underlain by the metasediments of the basin.

WILBERFORCE BASIN AIRBORNE SURVEY

Silver Hart Mines Ltd.
320 Sioux Rd.
Sherwood Park, Alta., T8A 3X6

Gold
76 K/13,14; 76 N/2,3
66°46'-67°15'N
108°42'-109°17'W

REFERENCES

Fraser (1964); Fraser, Heywood and Mazurski (1978); Roscoe (1985); Schiller (1965); Thorpe (1966, 1972); Seaton (1984, 1988).

DIAND assessment reports: 017144, 017151, 017163, 017166, 081345, 082095.

PROPERTY

BACK 1; BEAVER 2,4; BOOTH; CRACROFT 2; FARN; GAP; HARE; HOOD 1-10; KNUT; OTTER; OWL; OWL 2-5; PISTOL 2,3; TURN; TURNER; WOLF 5-9.

LOCATION

The claims and survey areas are from 535 km to 590 km northeasterly of Yellowknife, and extend across the James, Hood and Booth Rivers (Fig. 8-15).

HISTORY

Noel Avadluk discovered gold south of Wilberforce Falls in 1964 and staked 36 NOEL claims to cover the showings. Later the showings were staked as the FARN and KNUT claims. The history of exploration to 1985 is summarised in Schiller (1965), Thorpe (1966, 1972), Seaton (1984) and Seaton *et al.* (1987).

The FARN and KNUT claims were recorded in October 1979; BOOTH, HARE, HOOD 1, OWL and TURNER in March 1984; HOOD 2, OTTER and WOLF 5-9 in September 1984; BACK 1 in December 1984; BEAVER 2-4, CRACROFT 2, GAP 1, 2, HOOD 3-7 and PISTOL 2, 3 in September 1985; and HOOD 8-10 and OWL 2-5 in October 1986.

DESCRIPTION

The only published map of the area is in Fraser (1964) and is a 1:506 880 geological reconnaissance map of a much larger area.

The Wilberforce Basin is crudely H-shaped with the bar of the H oriented northwesterly. A zone of metasediments with units of iron formation, argillite and curiously conglomerate (indicating rapid change from low energy to high energy depositional environments), describes an arc convex to the west and up to 2 km wide extending northerly through the central part of the basin, which is mainly filled with greywacke metaturbidites. A second much shorter zone of iron formation trends northerly through the FARN-KNUT property. Structure of the basin is not well known. On the FARN-KNUT claim block, where mapping and drilling have detailed the stratigraphy, a stratigraphically lower silicate iron formation is separated from overlying oxide iron formation by some 245 m of quartz-biotite schist which includes a 2-m-wide unit of graphitic argillite. This sequence has been isoclinally folded. Fold axes and axial planes of the folds plunge and are inclined southwesterly. Beds are overturned on the eastern limbs of the folds (personal communications: C. Staargard and Silver Hart Mines Ltd.'s Annual Report, 1986). At 67°05'N, 109°11'W on BEAVER 4 claim in the central part of the Wilberforce Basin iron formation dips steeply northwesterly and is stratigraphically overlain a few metres to the northwest by conglomerate in which granitoid clasts are enclosed in a black argillite matrix.

The Wilberforce Basin is flanked to its west by granitoid and locally gneissic and migmatitic granitoid rocks. A granitoid pluton projects southwesterly into the basin west of Wilberforce Falls. To the east and southeast the Archean rocks of the Wilberforce Basin are overlain by, or in faulted contact with, Proterozoic sediments of the Goulburn Group, though a mafic to ultramafic sill-like complex is intruded along the unconformity along much of its length (Roscoe, 1985). This intrusion has been staked in part for its copper, nickel and platinum group metal potential (BOOTH, HARE and OWL claims).

The zones of iron formation in the Wilberforce Basin may be continuous beneath Proterozoic cover with auriferous iron formations in the George Lake area of the Beechey Lake Basin, but this is highly speculative.

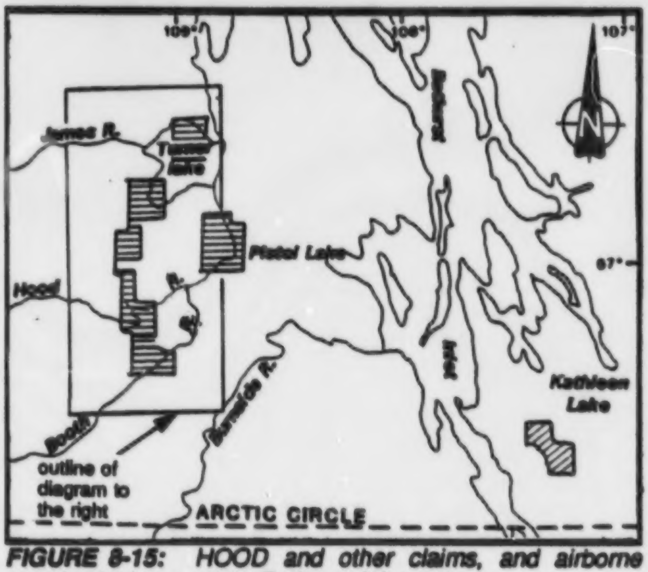

109°
108°
107°
James R.
Turner lake
Pistol Lake
Hood
R.
R.
Bathurst
Inlet
67°
Kathleen Lake
Booth
Burnside R.
outline of diagram to the right
ARCTIC CIRCLE
N

FIGURE 8-15: HOOD and other claims, and airborne geophysical coverage, Bathurst Inlet area.

Metamorphic grade in the Wilberforce Basin is mostly lower amphibolite (Fraser, Heywood and Mazurski, 1978), but increases to upper amphibolite towards the southwestern margin of the basin toward the contact with flanking migmatitic and gneissic rocks. Though gold in iron formation has been the main target of exploration in the Wilberforce Basin for several years, discovery of gold with arsenopyrite and pyrrhotite in a quartz stockwork in a zone described as an albitite dyke on the TURNER claim (Silver Hart Mines Ltd.'s Annual Report, 1986) and the presence of weakly auriferous tuffs may indicate other targets have been overlooked.

CURRENT WORK AND RESULTS

From May to July 1986 an electromagnetic/resistivity/magnetic/VLF EM (DIGHEM III) survey, was flown over three areas in the Wilberforce Basin (Fig. 8-15). Most of the areas flown had already been staked, with the exception of the OWL and HARE claims. The three areas flown and the claims which cover them are shown in Figure 8-15.

Numerous linear conductors were delineated in belts of metasediments containing iron formation and in the Turner Lake (TURNER, TURN claims) areas. Many of these conductors have coincident or flanking magnetic anomalies, suggestive of magnetite- or pyrrhotite-bearing iron formation. Many magnetic highs, generally conformable to the strike of the metasediments, but locally cross cutting, are probably caused by gabbroic sills or dykes such as the large one to the west of the gold-bearing zones on the FARN and KNUT claims. Such magnetic sills are distinct from the Helikian Mackenzie dykes which form prominent northwesterly trending magnetic features.

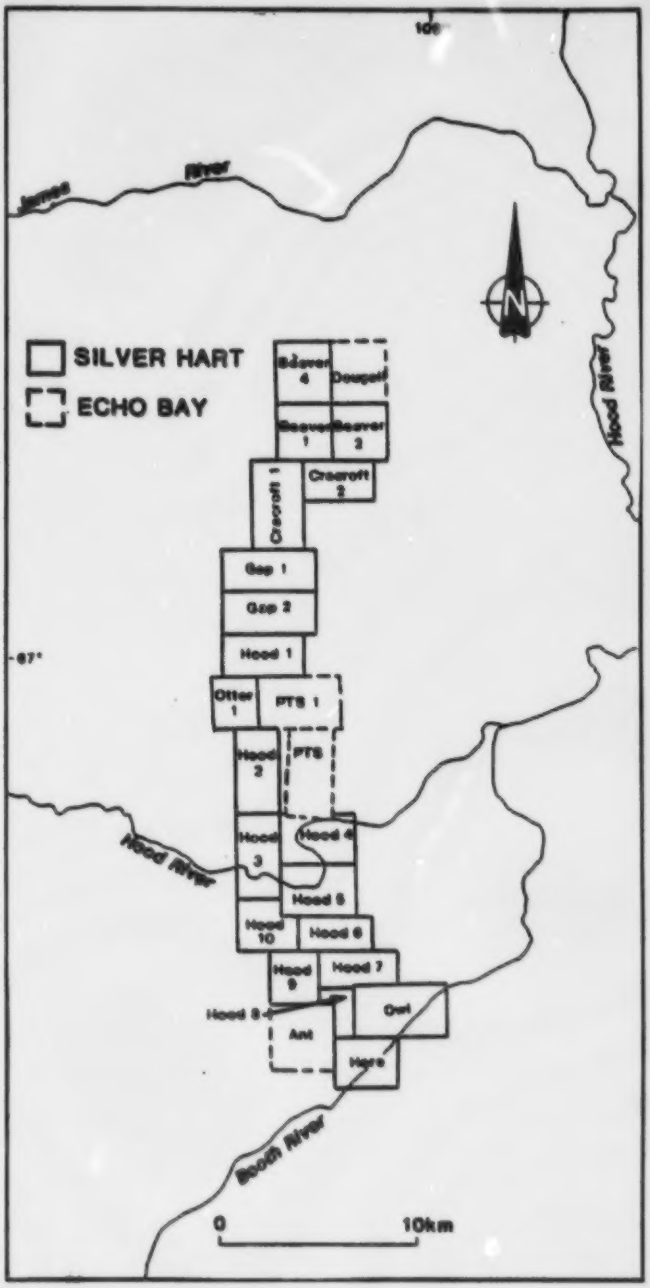
PTS CLAIMS

Echo Bay Mines Ltd.
Exploration Office
354 Granville Sq.
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
76 K/14
66°57'N, 109°10'W

REFERENCES

Fraser (1964).
DIAND assessment reports: 017150, 082084.


109°
James River
SILVER HART
ECHO BAY
Beaver 4
Doupe
Beaver 1
Beaver 2
Crecroft 1
Crecroft 2
Gap 1
Gap 2
Hood 1
67°
Otter 1
PTS 1
Hood 2
PTS
Hood 3
Hood 4
Hood River
Hood 5
Hood 10
Hood 6
Hood 9
Hood 7
Hood 8
Owl
Ant
Hare
Hood River
Booth River
0
10km
N

PROPERTY

PTS, PTS 2.

LOCATION

The property is 555 km northeasterly of Yellowknife. The southeast corner of the PTS claim is on the north bank of the Hood River (Fig. 8-16).

HISTORY

NTS area 76 K/14 was explored in 1965 by Roberts Mining Company Ltd. as Prospecting Permit 41.

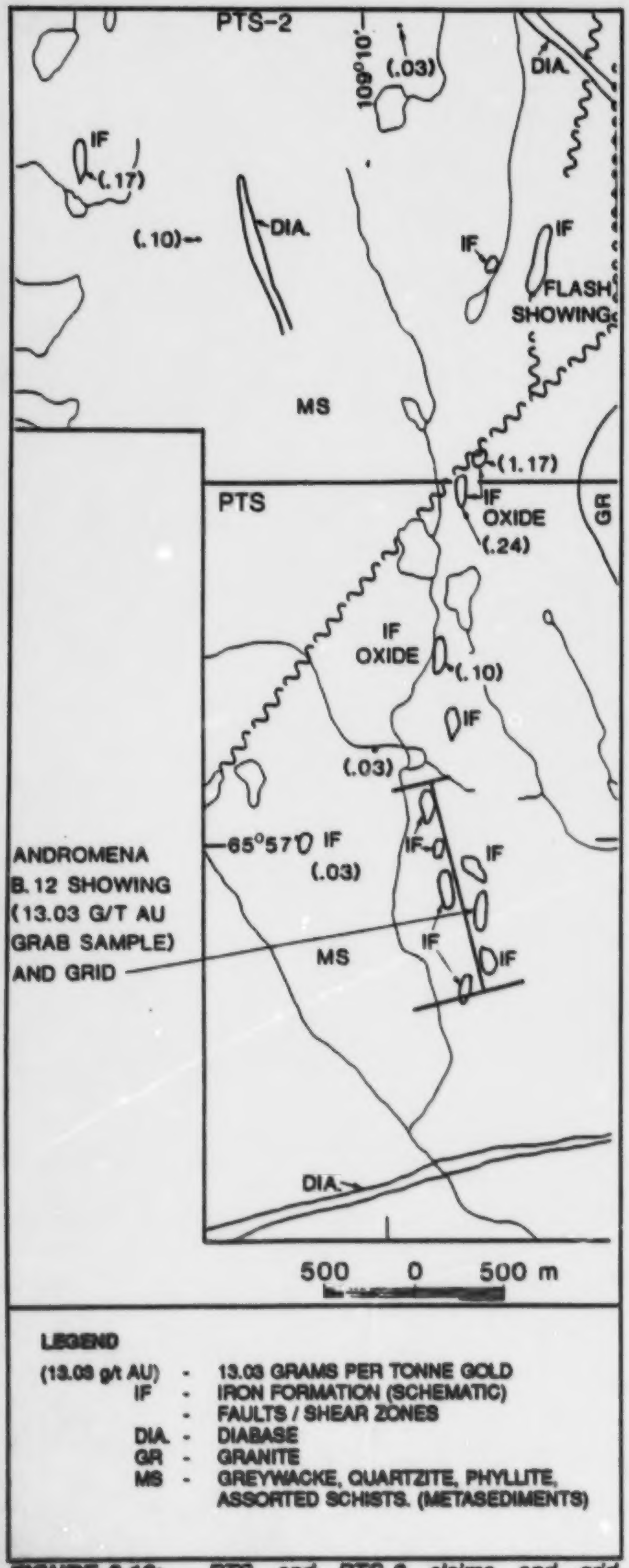

PTS-2
109°10'
(.03)
DIA.
IF
(.17)
(.10)
DIA.
IF
IF
FLASH
SHOWING
MS
(1.17)
PTS
IF
OXIDE
(.24)
GR
IF
OXIDE
(.10)
IF
(.03)
65°57'
IF
(.03)
IF
IF
ANDROMENA
B.12 SHOWING
(13.03 G/T AU
GRAB SAMPLE)
AND GRID
MS
IF
IF
DIA.
500
0
500 m
LEGEND
(13.03 g/t AU) - 13.03 GRAMS PER TONNE GOLD
IF - IRON FORMATION (SCHEMATIC)
- FAULTS / SHEAR ZONES
DIA. - DIABASE
GR - GRANITE
MS - GREYWACKE, QUARTZITE, PHYLLITE, ASSORTED SCHISTS. (METASEDIMENTS)

FIGURE 8-16: PTS and PTS 2 claims and grid. Geology from DIAND assessment report 082084.

The PTS claim was recorded in October, 1984 and covers the Andromena or B-12 gold showing discovered in August, 1984, in the course of a helicopter traverse during reconnaissance of the Booth River area. PTS 2 was recorded in September, 1985 to cover northern extensions of the auriferous iron formation outcropping on and north of the Andromena grid.

DESCRIPTION

The area was first mapped in 1962 at 1:506 880 in the course of a regional helicopter reconnaissance (Fraser, 1964). In 1964 Roberts Mining Company Ltd. geologically mapped Prospecting Permit 41 (76 K/14) at 1:60 000 (DIAND assessment report 017150). Claims PTS and PTS 2 are underlain almost entirely by greenschist facies metasediments, which have a general northerly strike and locally include iron formation lenses which form a zone in sheared and poorly exposed metasediments, which can be traced northwards from the central part of PTS to the eastern part of the PTS 2 claim. The zone appears to be displaced dextrally by a northeast-trending fault at the northern boundary of the PTS claim. Iron formation also outcrops at one locality in the northwest part of PTS 2. The iron formation is locally auriferous.

CURRENT WORK AND RESULTS

In 1985 work was confined to the Andromena (B-12) grid (Fig. 8-16). A geological sketch map was prepared and a VLF EM test was performed on the two most northerly lines of the grid, where a conductor coincides with northerly to north-northeasterly trending locally arsenopyrite- and pyrite-rich iron formation.

One hundred and twenty-three samples were collected. Auriferous samples were scattered along the length of the grid and were found to be associated with sulphide-rich iron formation.

HOOD RIVER PROJECT

Silver Hart Mines Ltd.	Gold
209, 320 Sioux Rd.	76 K/14; 76 N/3
Sherwood Park, Alta., T8A 3X6	66°46'-67°08'30"N
	108°57'-109°17'00"W

REFERENCES

Fraser (1964); Roscoe (1985).

DIAND assessment reports: 017150, 019556, 019577, 060268, 082084, 082095, 082566, 082567, 082568, 082600.

PROPERTY

BEAVER 1, 2, 4, CRACROFT 1, 2, GAP 1, 2, HARE, HOOD 1-10, OWL.

LOCATION

The property extends 36 km in a northerly direction (Fig. 8-15). It is centred on latitude 67°N, 560 km northeasterly of Yellowknife and 30 km west of Portage Bay, Bathurst Inlet.

HISTORY

The area was geologically mapped at 1:506 880 in a 1962 (Fraser, 1964) helicopter reconnaissance.

The first documented mineral exploration was by Roberts Mining Company Ltd. in 1964 (DIAND assessment report 017150), which held and explored Prospecting Permits 41

(76 K/14), 42 (76 N/2, Pistol and Turner Lakes) and 43 (76 N/6), and prospected adjacent areas. In the southeastern corner of NTS sheet 76 K/14 Roberts Mining Company reported evidence of drilling done a few years earlier. This could have been done by Canadian Nickel Company who were exploring in the northern Bear and northern Slave Provinces in the late 1950's and early 1960's.

Hope Bay Syndicate held claims in the area during the 1960's but little work was done (DIAND assessment reports: 019556, 019577, 060268).

Silver Hart Mines recorded the OWL, HARE and HOOD 1 claims in March 1984, the BEAVER 1, CRACROFT 1, OTTER 1 and HOOD 2 in September 1984. Silver Hart's BEAVER 2, 4, CRACROFT 2, GAP 1, 2 and HOOD 3-7 were recorded in September and HOOD 7-10 in October 1985. Echo Bay Mines Ltd. claims which adjoin Silver Hart's property are the DOUGALL, PTS, PTS 1 and ANT, recorded between October 1984 (PTS) and October 1985. Work on the PTS claims for 1984 and 1985 is documented in DIAND assessment report 082084, and on the DOUGALL claims from 1984 to 1987 in DIAND assessment reports 082566, 082567 and 082568.

DESCRIPTION

Silver Hart's Hood River Property (Fig. 8-15) extends 36 km in a north-northwesterly to north-northeasterly arc, convex to the west across the Wilberforce Basin, a structural basin filled largely with Archean turbiditic metasediments of the Yellowknife Supergroup. The claims cover an arcuate trend of iron formations, which include oxide and silicate facies. Sulphidic zones are found in both the silicate and oxide facies. The sulphidic zones are more commonly auriferous in the silicate than the oxide iron formation.

The Wilberforce Basin is bounded to the west by Archean granitoid rocks which intrude the Yellowknife Supergroup rocks and migmatitic rocks of which the Yellowknife Supergroup metasediments locally form part. The basin is bordered to the northeast and southeast by Aphebian sediments of the Goulburn Group which locally unconformably overlie or are in faulted contact with the Archean rocks, but more commonly are separated from the Archean rocks by a sill-like body of gabbroic rock, or the erosional remnant of a mafic-ultramafic complex of late Archean or early Proterozoic age.

Oxide iron formation and Proterozoic diabase dykes of the northwesterly trending Mackenzie Swarm form strong magnetic features in the Wilberforce Basin. Mafic magnetic sills which locally are close to iron formation locally complicate interpretation of magnetics. Easterly trending Proterozoic diabase dykes predate the Mackenzie swarm and are most numerous in the northern part of the property.

CURRENT WORK AND RESULTS

In 1986 Silver Hart Mines flew DIGHEM III surveys over four survey blocks in the Bathurst Inlet area: the Hood River Project area, Turner Lake area, Pistol Lake area, all in the Wilberforce Basin or at its margins (Fig. 8-15) and the Kathleen Lake area on the east side of Bathurst Inlet. Frequency domain EM and VLF EM resistivity, EM magnetic (derived from frequency domain EM), total field magnetics and enhanced magnetics results were plotted on 1:10 000 photomosaics.

Of these techniques, enhanced magnetics (in which magnetic data are manipulated to enhance local as opposed to regional features), proved the most effective in delineating both oxide and silicate iron formation. VLF EM was also found generally useful in delineating stratigraphic trends, and of particular use in delineating a unit of locally sulphidic silicate iron formation west of the oxide iron formation.

Subsequent to the DIGHEM III survey the claims were geologically mapped at 1:10 000 and samples taken throughout the claims. Most rock samples were grab samples of iron formation and were analysed for gold, as were a few chip samples. Samples of selected rocks (Booth River granophyre, HOOD and BEAVER 1 claims crystal tuff, mafic volcanics from BEAVER 4, and diorite, pyroxene gabbro and amphibolite from ground adjoining the Hood Property) were sent for whole rock analysis. Thirteen samples of iron formation taken during initial reconnaissance were analysed for 24 elements by I.C.P. technique. Nineteen rock samples were collected for thin sectioning and petrographic examination.

Geological mapping used in conjunction with geophysical data traced units of iron formation along a 33 km-long belt (Fig. 8-15). Most of this iron formation is oxide (magnetite) iron formation and "consists of bands of massive or disseminated magnetite rhythmically interbedded with yellowish green grunerite and recrystallised chert on a scale of millimetres to decimetres." (DIAND assessment report 082600). The silicate iron formation "... is generally thinner and more discontinuous than the oxide iron formation. These horizons (silicate iron formations) are chiefly composed of millimetre to centimetre scale banded silicious amphibolite .... Almandine garnets are locally so numerous as to produce discrete bands. Lenses and layers of fine recrystallized chert are common." These descriptions of iron formation would apply throughout the northern Slave Province in those localities where metamorphic grade has been adequately high to produce garnets.

Sulphides in oxide iron formation locally constitute as much as 10% by volume and include pyrite and/or pyrrhotite, rarely arsenopyrite, mainly as fine disseminations and veinlets.

In the silicate iron formation sulphides may locally exceed 20% by volume. In one case disseminated pyrrhotite alone is reported to reach 20% with 1% arsenopyrite and 29.35 ppm Au (fire assay).

Of nine samples from the Hood River Property with geochemical analyses of more than 1000 ppb Au, four were from silicate iron formation or silicic amphibolite and three were from oxide iron formation. The samples from silicate iron formation contained between 1280 and 28 000 ppb Au, those from oxide iron formation ranged from 1200 ppb to 2280 ppb. A rock from the CRACROFT claim described in a petrographic report as felsic crystal tuff, with a whole rock analysis of 49.71% SiO_2 12.02% Al_2O_3, 10.59% Fe_2O_3, 10.60 MgO, 7.04% Fe, 2.91% Na_2O and 0.82% K_2O was found locally to contain gold. Outside the property, boundary felsic tuffaceous rock has been found to contain locally as much as 25 000 ppb Au. None of the gold anomalies reported had any significant width or strike extent. Commonly, grab samples from iron formation contained 5 to 10 ppb Au.

WOLF CLAIM

Silver Hart Mines Ltd.
209, 320 Sioux Rd.
Sherwood Park, Alta., T8A 3X6

Gold
76 K/15; 76 N/2
67°03'N, 108°47'W

REFERENCES

Fraser (1964); Schiller (1965); Thorpe (1966, 1972); Seaton (1984); Seaton *et al.* (1987).

DIAND assessment reports: 017144, 017151, 017163, 017166, 081345, 082607.

PROPERTY

WOLF 6.

LOCATION

The property is 575 km northeasterly of Yellowknife and less than 1 km west of the Hood River. Wilberforce Falls is 2.5 km north of the property.

HISTORY

The claim adjoins and lies east of the KNUT claim which together with the adjacent FARN claim (Fig. 8-17) has been the focus of many years of gold exploration (Schiller, 1965; Thorpe, 1966, 1972; Seaton, 1984; Seaton *et al.*, 1987; and DIAND assessment reports cited). The WOLF 6 claim was recorded for Silver Hart Mines in October, 1986.

DESCRIPTION

The property is underlain mainly by turbiditic metasediments of the Yellowknife Supergroup of amphibolite metamorphic grade.

CURRENT WORK AND RESULTS

A grid was constructed over the southwestern part of WOLF 6 and the eastern part of the KNUT claim (Fig. 8-17).

The grid was explored by magnetometer survey. Strong northwesterly and northerly trending positive magnetic features join in the southern part of the grid and suggest folded iron formation.

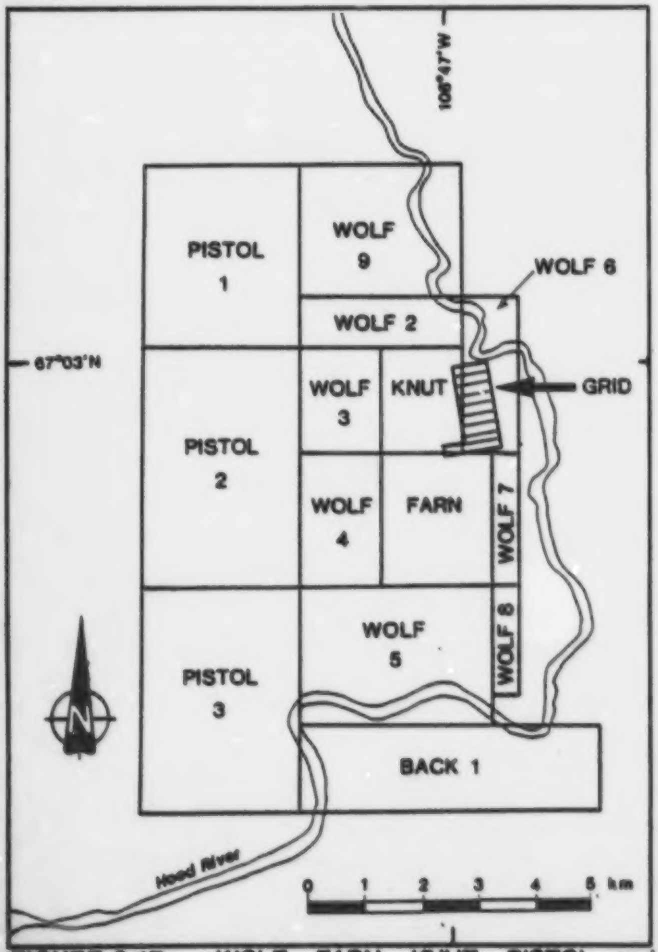


FIGURE 8-17: WOLF, FARN, KNUT, PISTOL and BACK claims and WOLF 6 grid.

TURNER LAKE PROJECT

Silver Hart Mines Ltd.
209, 320 Sioux Rd.
Sherwood Park, Alta., T8A 3X6

Gold, Nickel,
Copper, Cobalt
76 N/2,3,6,7
67°13'N, 106°56'W

REFERENCES

Fraser (1964); Schiller (1965); Thorpe (1966).
DIAND assessment reports: 017143, 017145, 017149, 017152, 017166, 082608.

PROPERTY

TURNER 1, TURN 1-5.

LOCATION

The claims are 590 km northeasterly of Yellowknife and 3 km east of the confluence of the Hood and James rivers. Turner Lake, which drains northward into the James River, occupies part of the TURNER 1 and TURN 1 claims (Fig. 8-18).

HISTORY

The Main Gold Showing at Turner Lake on TURNER 1 claim was discovered by Noel Avadluk and George Turner who were prospecting for Roberts Mining Company Ltd. in 1963-1964. In 1964 Roberts Mining Company staked contiguous CCI 1-36 and COM 1-36 claim groups to secure the gold showing and nearby nickel-copper(-cobalt) showings respectively, and acquired Prospecting Permits 41 (76 K/14), 42 (76 N/2) and 43 (76 N/6).

During 1964 and 1965 Roberts Mining Company geologically mapped Prospecting Permit 42 at 1:60 000, and the CCI and COM claims at 1:12 000. Other work included magnetometer surveys of the Main Gold Showing and Main Nickel Showing (Nickel Knob), and EM traverses across the latter. The Main Gold Showing was explored by several trenches that were mapped at 1:300. Samples from the largest trench averaged 8.5 g/t Au but two diamond drill holes, totalling 165 m, drilled under this trench intersected much lower concentrations (2.4 g/t Au across 3.05 m).

The history of exploration at Turner Lake and adjoining areas is summarised in Schiller (1965) and Thorpe (1966) and recorded in the several assessment reports cited.

After 1965 little work was done at Turner Lake apart from some additional trenching and sampling by the Hope Bay Syndicate in 1967, the results of which are not available.

Silver Hart Mines Ltd. recorded TURNER 1 in March 1984 and TURN 1-5 in November 1985 following preliminary sampling in 1984.

DESCRIPTION

The Turner Lake Property (Fig. 8-18) is at the northern end of the Wilberforce Basin. The northeastern part of the property is underlain by granitoid rocks which are intrusive into turbiditic metasediments of the Yellowknife Supergroup that underlie much of the southern and central part of the claim group.

A shear zone extends south-southwesterly from the centre of the property on TURNER 1 to beyond its southern margin. West of this shear zone lies a belt of metasediments 1 to 1.5 km wide alternating with sill-like intrusions of diorite, amphibolite and granodiorite. The belt is flanked to the west by a unit of polymictic conglomerate which is roughly 250 m thick, and has been traced for more than 6 km across the Turner

Lake Property from 1.5 km south of the James River to the southern boundary of the TURNER-TURN claim block. East of the shear zone, the rocks are similar to those to its west, but are folded and lack the north-northeasterly trend of the belt seen to the west of the shear zone.

Several diabase dykes of the Mackenzie Swarm trend northwesterly across the Turner Lake Property and a broad segmented gabbroic body, locally as much as 1 km wide, trends north-northwesterly through the claim block from the southeast corner through the central part of its northern boundary.

The Main Gold Showing is about 750 m west of Turner Lake. A small stock of olivine gabbro flanked by turbiditic metasediments lies 2.5 km south-southwest of the Main Gold Showing. The Main Nickel Showing (Nickel Knob Showing) is at the southwestern contact of the olivine gabbro plug.

CURRENT WORK AND RESULTS

In 1986 the Main Gold Showing was geologically mapped at 1:1000, sampled and explored by magnetometer and VLF EM surveys. A DIGHEM III survey was flown over the property (see Wilberforce Basin Airborne Survey). After the Main Gold Showing was mapped, some 50% of the property was geologically mapped at 1:10 000, prospected and sampled. Most of the mapping was in the southern and central part of the claim block, on TURNER 1 and TURN 2, but less complete coverage extended into other parts of the property. Magnetometer and VLF EM surveys were conducted at the Nickel Knob (Ni-Cu-Co) Showing.

At the Main Gold Showing (67°12'45"N, 108°55'45"W), native gold was found with arsenopyrite and pyrrhotite in a quartz stockwork. The stockworks are reported to be developed in "albitite" dykes cutting amphibolitised pyroxene gabbro where these rocks have been folded on a scale of about 500 m. There are at least three gold-bearing zones within a strike length of 500 m (DIAND assessment report 082608). Field examination of the trenched showing by the writer did not suggest to him that the host rock was an albitite; rather it appeared to be silicified amphibolite. If the encouraging gold assays are related to concentration of gold in steeply plunging fold noses, then there is a reasonable chance of gold-bearing zones extending to depth.

A magnetometer survey showed the Main Gold Showing to be associated by a weak and discontinuous positive magnetic anomaly. A VLF EM survey did not provide useful results.

The Nickel Knob (Ni-Cu-Co) Showing and associated olivine gabbro plug are coincident with well-defined magnetic anomalies. The VLF EM survey at Nickel Knob gave ambiguous results.

During prospecting and sampling of the Turner Lake property a gold showing was found immediately east of Turner Lake at 67°11'45"N, 108°54'30"W. It is a 1-2 m wide quartz-veined pelitic zone containing up to 28 ppm Au in grab samples. Gold is associated with quartz, arsenopyrite and pyrrhotite.

Numerous showings of copper, nickel, cobalt and arsenic were found in the diorite intrusions near their contacts with other rocks, particularly with granodiorite and pyroxene gabbro. Grab samples from trenches 1.4 to 2.4 km north of the Main Gold Showing, that were excavated by Roberts Mining Company on their COM claims (now TURNER 1) contain up to 0.8% Cu, 1.04% Ni, 0.118% Co and 500 ppb Au. Gold content is anomalous in several other nickel-copper-cobalt showings. Sulphides in these showings are disseminated in the diorite and include pyrrhotite, minor pentlandite, chalcopyrite, arsenopyrite, niccolite, gersdorffite, safflorite, pyrite, galena.

Five samples were collected for petrographic examination and whole rock analysis. These included granodiorite, diorite, "mineralised zone-proximal", "mineralised zone-distal" and conglomerate.

In 1987 the Main Gold Showing was explored by diamond drilling. Seventeen holes totalling 1601 m were drilled.

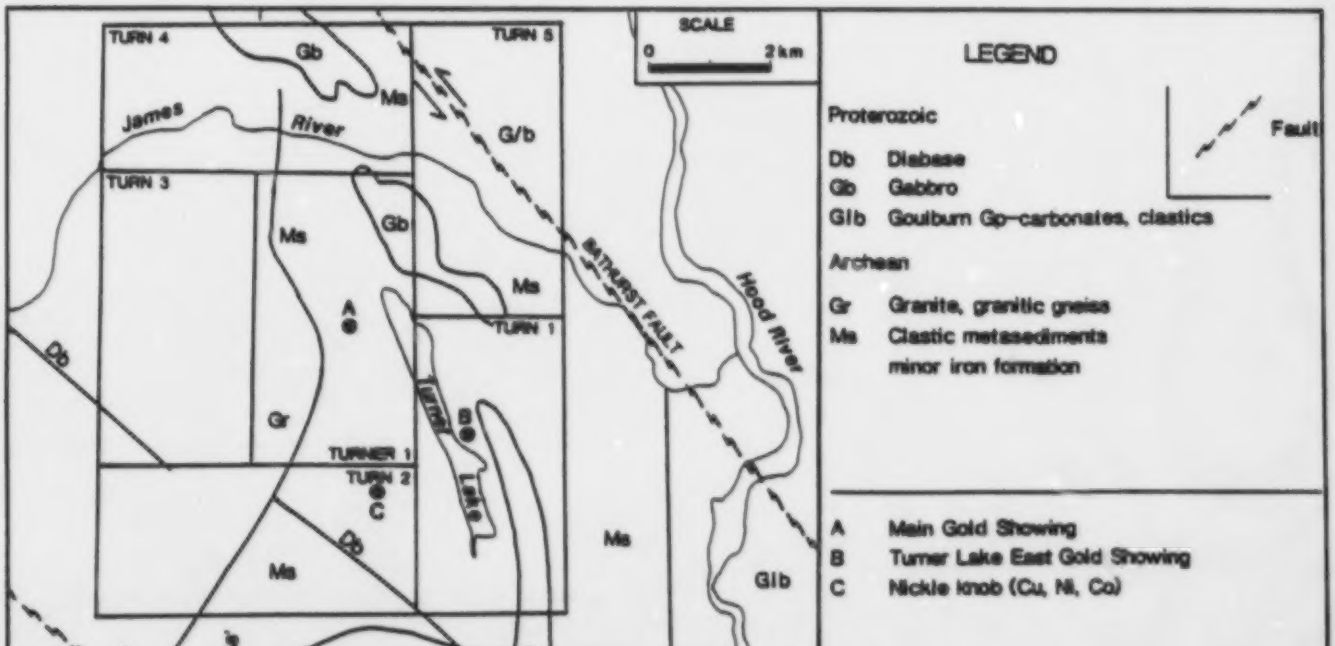
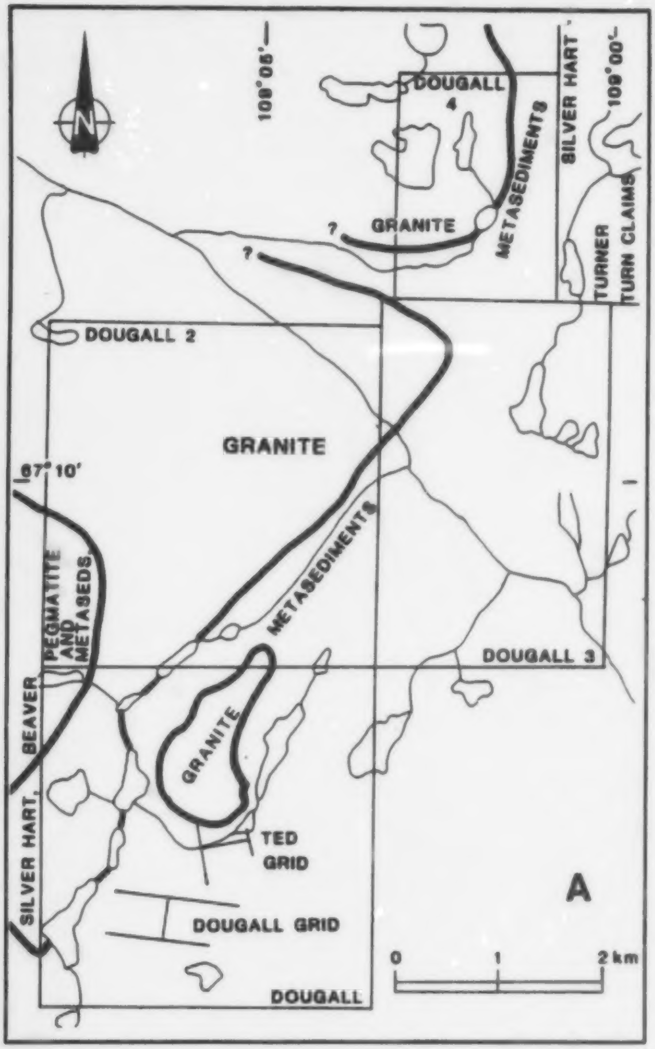


FIGURE 8-18: TURNER and TURN claims. Geology from assessment report 082608.


N
109°05'
DOUGALL 4
GRANITE
METASEDIMENTS
SILVER HART
109°00'
TURNER TURN CLAIMS
DOUGALL 2
GRANITE
67°10'
METASEDIMENTS
PEGMATITE AND METASEDS.
BEAVER
SILVER HART
DOUGALL 3
GRANITE
TED GRID
A
DOUGALL GRID
0
1
2 km
DOUGALL

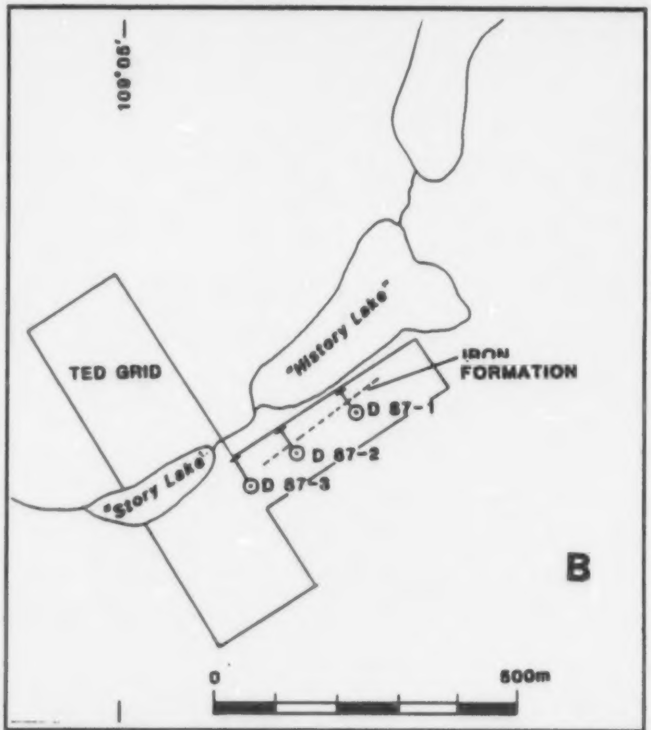

109°05'
TED GRID
"History Lake"
IRON FORMATION
D 87-1
D 87-2
D 87-3
"Story Lake"
B
0
500m

FIGURE 8-19: DOUGALL claim and grids. Geology simplified from DIAND assessment reports 082566, 082567, 082568.

DOUGALL CLAIMS

Echo Bay Mines Ltd.
354 Granville Sq.
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
76 N/3
67°09'N, 109°03'W

REFERENCES

Fraser (1964).
DIAND assessment reports: 082566, 082567, 082568.

PROPERTY

DOUGALL, DOUGALL 2-4.

LOCATION

The claims are 585 km northeasterly of Yellowknife and about 13 km southwest of the confluence of the Hood River and James River.

HISTORY

The area was prospected for gold in the 1960's by Roberts Mining Company Ltd. DOUGALL (or DOUGALL 1) was recorded for Echo Bay Mines August 1985, DOUGALL 2 and 3 in September 1985 and DOUGALL 4 in October 1985.

During a 1984 regional reconnaissance, Echo Bay Mines discovered iron formation on the DOUGALL claims. The iron formation is mainly silicate and sulphide poor with a few sulphide-rich lenses which were locally auriferous, as was pyrrhotite-rich silicious greywacke at the Ted A Zone.

During 1984 and 1985, DOUGALL 1-4 claims were explored by prospecting, rock and soil sampling grid surveying, geological mapping, magnetometer and VLF EM surveys. All of this work was confined to two grids: the Ted Grid and Dougall Grid on DOUGALL 1 (Fig. 8-19). Soil sampling was done only on the Dougall Grid and VLF EM only on the Ted Grid. On each grid there are two gold showings (DIAND assessment report 082568).

DESCRIPTION

The only published geological map is by Fraser (1964). Fraser and others mapped the area at 1:506 880 as part of a 1962 helicopter supported reconnaissance.

The DOUGALL claims are largely underlain by the Yellowknife Supergroup metasediments which fill the Wilberforce Basin. In the northeastern part of the property much of DOUGALL 2 and about half of DOUGALL 4 is underlain by granitoid rock. A small granitic stock occupies the north-central part of DOUGALL 1. Units of iron formation outcrop mainly on DOUGALL 1 near the granitic stock and in an area to its southwest where it is spatially associated with polymictic conglomerate and numerous pegmatitic bodies.

A unit of conglomerate 100 to 300 m thick has been mapped by Echo Bay Mines geologists. The conglomerate trends northwesterly through the northern part of DOUGALL 3 and into the southern part of DOUGALL 4 where it is truncated at a granite contact. A unit of amphibolite and chlorite schist averaging about 150 m thick has been traced from the southeastern corner of DOUGALL 1 to the northeastern corner of DOUGALL 3 where it passes onto Silver Hart Mines' TURNER 2 claim.

Metamorphic grade on the claims ranges from upper greenschist to lower amphibolite.

CURRENT WORK AND RESULTS

In 1986 the Ted Grid area was explored by a magnetometer survey, prospecting and trenching. High gold assays from the Ted A Zone in the north-central part of the grid confirmed results of earlier sampling. A 200 m long northeasterly trending magnetic high coincides with the Ted A Zone of auriferous pyrrhotite-rich silicious greywacke and closely associated iron formation. A narrow northwesterly trending magnetic high was delineated along the Ted B Zone in the southern part of the grid.

In 1987 the Ted Grid was extended across the ice of two small lakes (Fig. 8-19) and a magnetometer survey conducted over the grid extension, and later in areas west and south of the Ted Grid. Additional prospecting was done on the DOUGALL 1-3 claims. On DOUGALL 2 and 3 claims conspicuous gossans were found and sampled.

Three holes totalling 155 m were drilled at the Ted A showing (Fig. 8-19).

Magnetometer surveying did not find extensions of the anomaly associated with the Ted A Zone. Samples from the gossan zones did not have encouraging gold contents, though samples from trenches excavated by Roberts Mining Company 1.3 km north of the Ted A Zone were strongly auriferous; a composite grab sample from one trench assayed 14.87 g/t Au.

The three diamond drill holes intersected mainly coarse conglomerate, lesser amounts of metagreywacke and thin zones of sulphide-poor iron formation, which in one hole was auriferous.

BEECHEY LAKE BASIN

The term "Beechey Lake Basin" is used in this report to denote the large area underlain by metasedimentary rocks centred at Beechey Lake. Metamorphic grade increases northwesterly and southeasterly towards the Thelon Front, away from the northwestern end of Beechey Lake. The Beechey Lake Basin adjoins the Hackett River volcanic belt (Frith, 1981a,b).

MR 1 CLAIM, PROSPECTING PERMITS 1042, 1043

Back River Joint Venture
Trigg, Woollett, Olson
Consulting Ltd.
10504 - 103 St.
Edmonton, Alta., T5H 2V4

Gold
76 G/3 NW,SE
65°00'-65°15'N
107°00'-107°30'W

REFERENCES

Frith (1981a,b); Gibbins *et al.* (1977); Seaton (1978).

DIAND assessment reports: 061343, 061344, 061392, 081973, 082134.

PROPERTY

MR 1 Claim; Prospecting Permits 1042, 1043.

LOCATION

The permits are 460 km northeasterly of Yellowknife. Permit 1043 is 1 km west of Casey Lake.

HISTORY

In 1974 and 1975, Du Pont of Canada Exploration Ltd. explored NTS quadrants 76 G/2 and 76 G/3 as Prospecting Permits 328 and 329, respectively (DIAND assessment reports: 061343, 061344, 061392; Gibbins *et al.*, 1977; Seaton, 1978). Du Pont's main target was base metal volcanogenic massive sulphides, but in the course of exploration a gold showing (currently staked as Cominco's BEE 1-3 claims; 15 km north-northeast of MR 1) was found. In 1983, Trigg, Woollett, Olson Consulting, as operators for Back River Joint Venture, performed prospecting and rock sampling on 76 G/3 NW and SE. The MR 1 claim was recorded in September 1984 and Prospecting Permits 1042, 1043 were granted on February 1, 1985. In 1984 the Prospecting Permits 1042 and 1043 areas were explored by reconnaissance prospecting and rock sampling and 1:10 000 geological mapping along strike from gold showings found in 1983, and the MR 1 claim was staked to cover auriferous zones in iron formation discovered in 1983 and 1984. Iron formation was discovered in 1984 in the northeastern quarter of Permit 1042 and in the north-central part of Permit 1043 in the "Needle Lake" area east and southeast of MR 1 claim. A gold showing was found in sulphide-bearing quartz veins within sulphidic zones in magnetite-chert iron formation at "Needle Lake" (Fig. 8-20). Sulphides recorded include pyrrhotite, pyrite and arsenopyrite; the latter closely associated with black cross-cutting quartz veins. Fine-grained conformable grey quartz veins were also reported. In 1985 exploration was confined to Prospecting Permit 1043 and comprised prospecting, rock sampling and 1:10 000 geological mapping.

DESCRIPTION

The regional geology of the area has been mapped and compiled by Frith (1981a,b). Figure 8-20 shows Prospecting Permits 1042 and 1043 and geology from Frith (1981a). Much of the permit area is underlain by Beechey Lake Group metasediments, after which granitoids are the most abundant rock type. A small part of Prospecting Permit 1042 is underlain by volcanics of the Hackett River Group and a yet smaller part by a narrow belt of Back Group volcanics. Cominco's Prospecting Permits 1053, 1054 and 1055 adjoin Prospecting Permit 1042 to the northeast, north and east respectively.

CURRENT WORK AND RESULTS

In 1986 work was concentrated at several gold showings in the northwestern quarter of Prospecting Permit 1043. The gold showings are in an arcuate belt peripheral to a tonalite pluton (Frith 1981a) and trending easterly through the MR 1 claim and southeasterly through "Scissor Lake" and "Needle Lake," which are some 300 m and 1100 m, respectively, from the northeastern end of the ovoid pluton (Fig. 8-20). Mapping by the Back River Joint Venture showed the dominant rock type in the belt to be grey to black fine-grained greywacke interbedded with and grading into mudstone. Several thinner units of iron formation which are locally sulphidic, mainly oxide-silicate and silicate, were mapped. Oxide iron formation contains mainly magnetite and chert; silicate iron formation contains varying proportions of chlorite, amphibole, chert and garnet. Work at three locales included one or more of the following methods: prospecting, overburden stripping, rock sampling, grid surveying, geological mapping at 1:5000, 1:2000 or 1:50, magnetometer and VLF EM surveying.

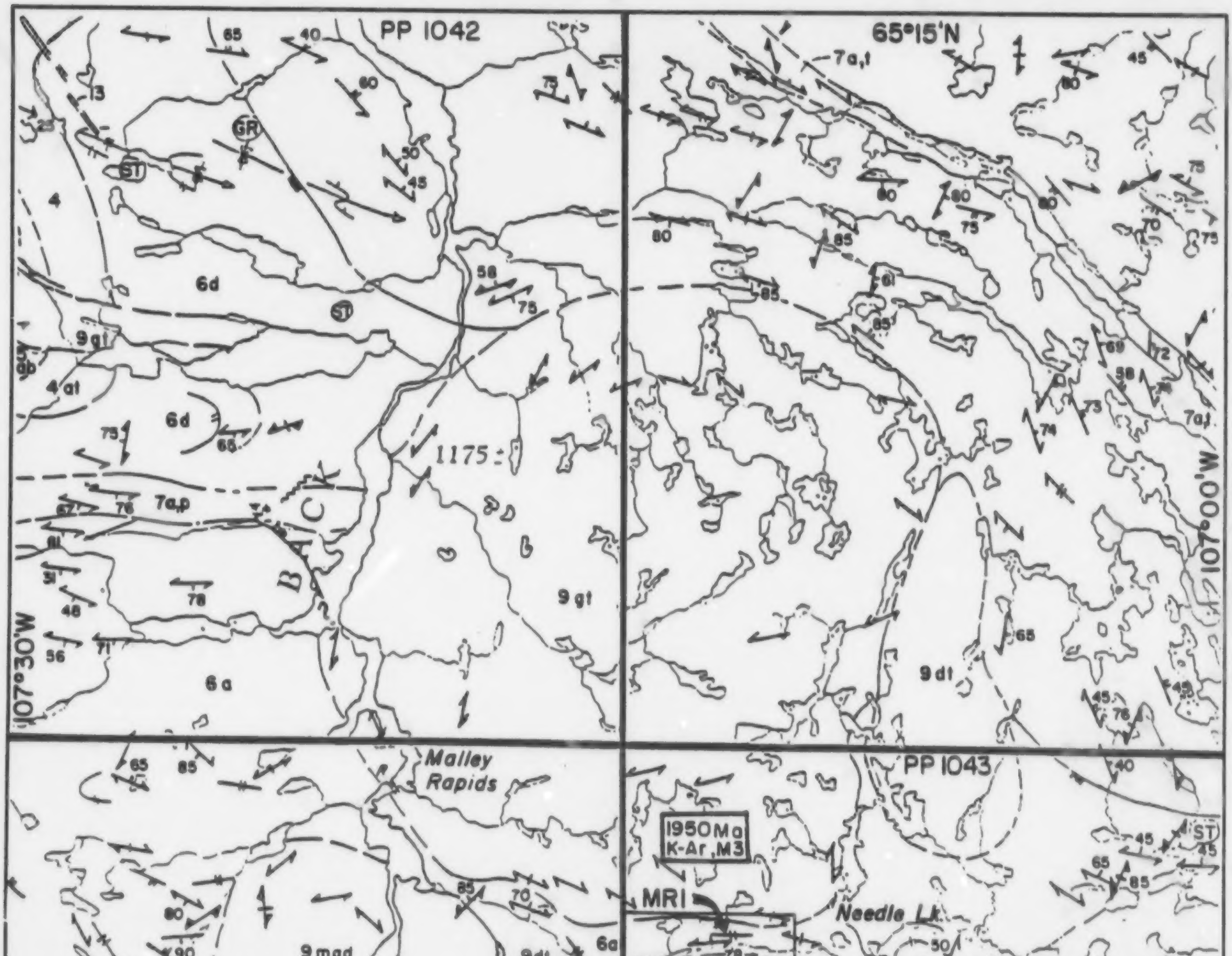

PP 1042
65°15'N
107°30'W
107°00'W
65°00'N
PP 1043
Malley Rapids
Needle Lk.
1950 Ma K-Ar, M3
MR1
1175±
1164±
BACK
SCALE
3
0
3
6
km
9gt
9dt
9mgd
9lgd
9tn
6a
6d
7a,p
7a,t
4at
0/B
ST
GR
CD
PY

FIGURE 8-20: MR 1 claim and Prospecting Permits 1042 and 1043. Geology from Frith (1981a).

LEGEND FOR FIGURE 8-20

QUARTERNARY

O/B	Sand and gravel

ARCHEAN

REGAN INTRUSIVE SUITE

9gt	Granite
9lgd	Leucogranodiorite
9dt	Diorite, quartz diorite

YELLOWKNIFE SUPERGROUP

BACK GROUP

7	7a, massive and pillowed andesite, porphyritic andesite and andesitic tuff.

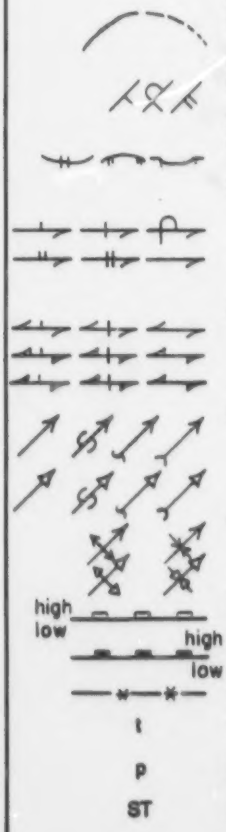
BEECHEY LAKE GROUP

6	6, undifferentiated greywacke, mudstone, carbonaceous shale; 6a, greywacke; 6b, mudstone; 6c, carbonaceous mudstone; 6d, porphyroblastic gneiss and schist derived from 6a-6c; 6e, locally migmatitic rocks derived from 6a-6c.

HACKETT RIVER GROUP

4	IGNERIT FORMATION: felsic and basic flows, fragmental volcanics, volcanic sediments, iron formation, chert, sulphide-rich zones; 4a, dacite, dacitic tuff; 4b, andesite, basalt, tuff; 4c, carbonate with dacitic fragmental rocks.

SYMBOLS



Geological boundary
(defined, approximate, assumed)

Bedding
(tops known, overturned, tops unknown)

Bedding trends
(dip unknown, tops unknown, tops known)

Bedding-cleavage:
S_1 (top known: inclined, vertical, overturned)
(top unknown: inclined, vertical, dip unknown)

Axial planar foliation:
S_1 (dip inclined, vertical, unknown)
S_2
S_3

Lineation:
L_1 (mineral, minor fold axis, warp axis, clast elongation)
L_2

Antiform, synform with plunge:
F_1
F_2

Biotite isograd

Staurolite-cordierite isograd

Sulphide-rich strata

t	Tuffaceous rock
p	Pillowed
ST	Staurolite

DIVING ELEPHANT PROJECT

Bow Valley Industries Ltd.
2020, 1177 W. Hastings St.
Vancouver, B.C., V6E 2K3

Gold
76 G/6,7,8,11,12
65°15'-65°37'30"N
106°12'-107°33'W

REFERENCES

Frith (1981a,b).
DIAND assessment report: 082070.

PROPERTY

BEEP 1-8; BOW 2-4; DEL 1-5; JB 2.

LOCATION

"Del Lake" sometimes known as "Diving Elephant Lake" is 505 km northeasterly of Yellowknife, and 8 km northeast of Beechey Lake.

HISTORY

BOW 2-4 and JB 2 were recorded in September, 1985 and are mainly southwest of Del Lake where a camp was established in 1985. BOW 2 is staked over a northwesterly trending auriferous zone. The remaining claims were recorded in December, 1985.

DESCRIPTION

The claims and adjoining areas that were geologically reconnoitred and prospected are shown in Figure 8-21. The area staked and geologically reconnoitred is largely underlain by Archean metasediments of the Beechey Lake Group. Metamorphic grade is on the low grade side of the cordierite-andalusite isograd except in the extreme southeast. Metamorphic grade also increases westward towards the Hackett River volcanic belt where several granitoid plutons are exposed. Frith (1981a,b) has mapped and compiled the regional geology at 1:125 000.

CURRENT WORK AND RESULTS

In 1985 Bow Valley Industries was operator of the project which comprised 1:31 680 geological mapping and prospecting of the property area and three adjoining areas, staking, and 1:2 000 geological mapping and geophysical surveys of the adjacent grids, H1 and H2, on BOW 2 and BOW 3 claims, respectively.

Areas reconnoitred and prospected but not staked in 1985 lie southeast of the BEEP, BOW, DEL, JB claim block on the southwest side of Beechey Lake and in the southwestern quadrant of NTS 76 G/11 and a small adjoining part of 76 G/12.

The H1 and H2 grids cover stratabound auriferous silicified zones with concordant and crosscutting quartz veins. The silicified zones contain 1%-4% euhedral arsenopyrite and locally, on the H1 grid, visible gold. Two grab samples from the H1 grid assayed slightly over 34 g/t Au and one sample assayed 67.4 g/t Au. The auriferous zones are unusual for the Beechey Lake area because the host rock is argillite, commonly crenulated, or greywacke with abundant intercalated argillite, as opposed to iron formation which hosts gold at several localities on the Back River Joint Venture property directly to the north. Bedding and cleavage which are parallel or subparallel to bedding dip steeply to the southwest on the H1 and H2 grids.

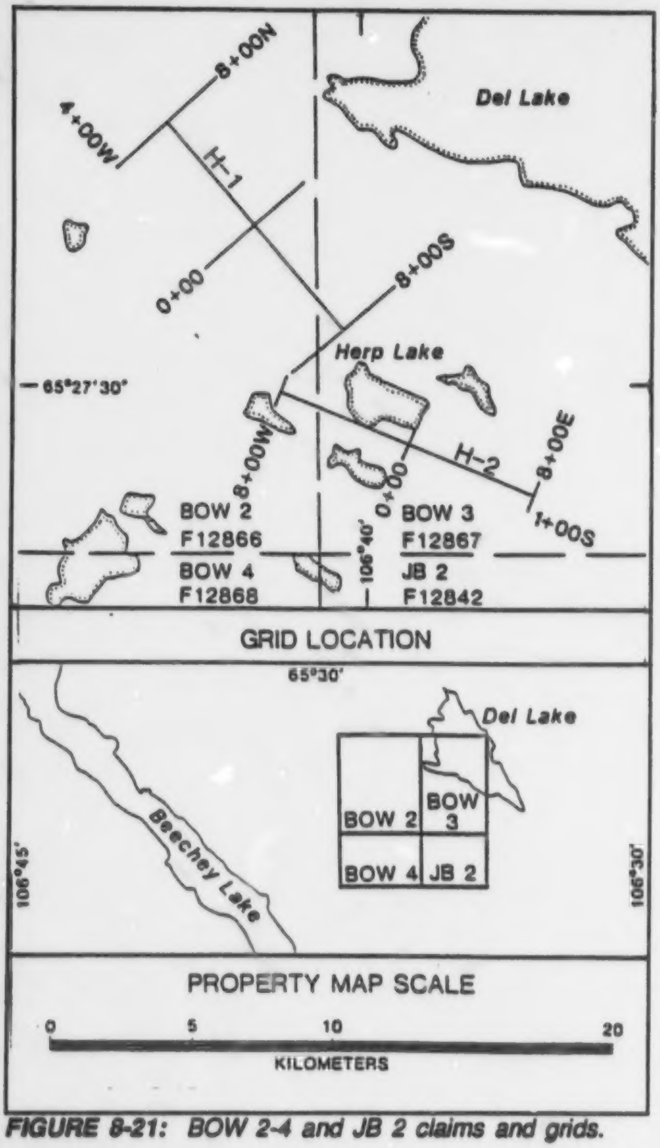


FIGURE 8-21: BOW 2-4 and JB 2 claims and grids.

The grid area is on the low grade side of the biotite isograd (Frith 1981b).

VLF EM conductors and locally coincident magnetic anomalies were outlined on both grids and may be caused by graphitic argillite, swamp, and concentrations of pyrrhotite and other sulphides.

In 1986 Bow Valley Industries' joint venture partner, Welcome North Mines Ltd., was operator. Work comprised geological mapping, prospecting and extensive trenching and chip sampling. Eleven diamond drill holes tested the most promising showings, but results were disappointing and the project was discontinued. Nine of the drill holes tested the Beechey zone near the extension of the H3 grid baseline (Fig. 8-21), the remaining two tested the Phoenix zone at the southeastern end of the H1 grid.

A zone of actinolite skarn and of sulphide-bearing skarn containing more than 2% arsenopyrite flanks much of the margin of a small granitic stock on BEEP 2. The zone was mapped and sampled. At the southern end of the stock within the sulphide-bearing skarn, a 30 m-long zone of massive sulphides (>30% chalcopyrite, pyrite, pyrrhotite, arsenopyrite and nicolite) yielded grab samples containing 7.25 g/t and 2.24 g/t Au.

BEECHEY LAKE NORTH PROJECT

Back River Joint Venture
c/o Trigg, Woollett, Olson
Consulting Ltd.
10504 - 103 St.
Edmonton, Alta., T5H 2V4

Gold
76 G/9-11,13-16;
76 J/4
65°30'-66°07'30"N
106°15'-107°45'W

REFERENCES

Frith (1981a,b,c); Seaton (1984); Seaton and Crux (1985); Seaton, Brophy and Crux (1987).

DIAND assessment reports: 081705, 081813, 081822, 081975, 082114, 082115, 082116, 082117, 082628, 082629, 082630, 082631, 082637.

PROPERTY

Prospecting Permits: 973, 1014-1017, 1032-1041, BRAU 1-56, 70, LAB 1, SO 1.

LOCATION

At the start of 1986 the Beechey Lake North Project (Fig. 8-22) comprised a single block of prospecting permits and claims that lay from 500 to 560 km northeasterly of Yellowknife and extended 105 km in a northwesterly direction. The southwestern corner of this property is at Beechey Lake. Expiry of Prospecting Permits 1014 - 1017 in February 1987 split the property into a northwest block (George Lake area) and a southeastern block that included: the Boulder Pond area, the Goose Lake area, the Boot Lake area and the Ellice River area.

HISTORY

Trigg, Woollett, Olson Consulting Ltd. has acted as manager of the Back River Joint Venture since its inception in 1982.

During the seventies several companies explored the Proterozoic rocks of the Bathurst Inlet area and the Proterozoic-Archean unconformity for uranium. In 1979 areas later held by Trigg, Woollett, Olson Consulting Ltd. as Prospecting Permits 973, 1016 and 1035 were held and explored for uranium by Urangesellschaft Canada Ltd. as Prospecting Permits 740, 739 and 742 respectively (Seaton, 1984).

Trigg, Woollett, Olson Consulting Ltd. acquired Prospecting Permit 973 on February 1, 1983, following 1982 reconnaissance. Permits 1014-1017 were acquired in February 1984 and Permits 1032-1041 in February 1985. LAB 1 and SO 1 were recorded in September 1984.

Prospecting Permit 973 expired in February 1986 and Prospecting Permits 1014-1017 in February 1987.

BRAU 1-9 (covering part of the George Lake area previously held as Prospecting Permit 973) were recorded in October 1985. BRAU 10-15 (that adjoin BRAU 1-9 to the south) were recorded in October 1986, prior to expiry of Prospecting Permit 1017. The remaining claims of the George Lake area (BRAU 39, 40, 70) were not recorded until October 1987, and were staked in anticipation of expiry of Prospecting Permit 1033 in February 1988.

In the Boulder Pond area, BRAU 16-23 were recorded in October 1986 in anticipation of the expiry of Prospecting Permit 1015, and BRAU 41-43 (on ground immediately to the south and bordering the SO 1 claim) were recorded in October 1987, prior to expiry of Prospecting Permit 1041.

In the Goose Lake area BRAU 50-56 were recorded in October 1987; the eastern half of the block on Prospecting Permit 1039 and the western half on Prospecting Permit 1040.

The Boot Lake area and Ellice River area are included in a single claim block. Until February 1987 the Boot Lake area and part of the Ellice River area were covered by Prospecting Permit 1014; BRAU 24-38 were recorded in October 1986 to secure this area. BRAU 44-49 were added to the claim block in October 1987 to secure ground on Prospecting Permits 1036 and 1037 which were due to expire the following year.

Locations of areas, prospecting permits and claim blocks are shown in Figure 8-22.

In 1985 four locales in the George Lake area and targets at Oar Lake and Rooster Lake were explored by a total of 2518 m of drilling in 35 holes. In the George Lake area a large trench was excavated at "Fold Nose", northeast of the lake and several other targets were explored.

The history of exploration of this project, one of the largest in the area and expenditure in the Slave Province, is reviewed very briefly in Seaton and Crux (1985) and Seaton, Brophy and Crux (1987).

DESCRIPTION

Roughly 75% of the area covered by the Beechey Lake North Project is underlain by Archean metasediments of the Beechey Lake Group, comprising greywacke, mudstone, carbonaceous mudstone, iron formation or their metamorphic derivative gneisses and schists (Fig. 8-22). Roughly two-thirds of the Archean metasediments are on the low grade side of the biotite isograd. Only about 10% of the permit area is underlain by metasediments on the high grade side of the staurolite-cordierite isograd (Frith, 1981a,b). The largest area of such rocks surrounds three biotite-muscovite granite stocks (Frith, 1981c), mainly on Prospecting Permits 1037 and 1040. In the southeast corner of the project area, on Permit 1039, the regional metamorphic gradient increases southeasterly towards the Thelon Front. An increase in metamorphic grade is also apparent at the northwestern margin of Prospecting Permit 1033, north of Index Lake, where several granodiorite plutons are exposed within an area of higher grade metasediments (Fig. 8-22).

The Archean metasediments within the project area are isoclinally folded and have a dominant northwesterly structural grain, as indicated by bedding and S_1 cleavages. An anomalous west-northwesterly strike of bedding exists in the southern part of Prospecting Permit 1014.

Ten of the fifteen prospecting permits of the Beechey Lake North Project are underlain, to varying extents, by Goulburn Group Proterozoic sediments of the Western River Formation. Prospecting Permit 1032 is underlain almost entirely by Proterozoic rocks.

CURRENT WORK AND RESULTS

George Lake area 76 G/13 NE, 76 G/14 NW, SW

1986: Prospecting Permits 973 (expired February 1986), 1017, 1033. BRAU 1-9, 10-15, 39, 40, 70; LAB 1. See DIAND assessment report 082117.

Of the six areas, the George Lake area was the most intensively explored in 1986. Work was concentrated at several gold-bearing zones and one geophysical target, and comprised one or more of reconnaissance prospecting, geological mapping at 1:10 000, 1:2000 and 1:1000 scales, ground magnetometer, VLF EM, horizontal loop EM (HLEM) and SP surveys, grid surveying, rock chip and rock grab sampling, and diamond drilling. A total of 2917 m was drilled in 31 holes at seven gold showings and one geophysical target.

1987: In 1987 drilling was confined to the George Lake area, where a total of 3,682 m was drilled in 20 holes at six localities. Only a small amount of exploration other than drilling was done.

Boulder Pond area 76 G/10 NW, SW

1986: Prospecting Permits 1015, 1041. BRAU 16-23, 41-43, SO 1. See DIAND assessment report 082115.

The Boulder Pond area extends roughly 15 km in a north-northwesterly direction. Boulder Pond is a 300 m long pond towards the northern end of this area. The Boulder Pond area is roughly 15 km southwesterly of the George Lake area.

Several gold showings, discovered in 1983 and 1984, and three targets that were delineated by the 1985 DIGHEM(R) airborne survey were explored. At each showing or geophysical target, work consisted of one or more of: prospecting, rock sampling, grid surveying, 1:5000 or 1:2000 scale geological mapping, ground magnetometer, and VLF EM and HLEM surveys.

Results of this work were considered sufficiently encouraging to warrant further exploration, including diamond drilling.

1987: Work comprised grid surveying, prospecting, rock sampling and geophysical surveys.

Ellice River area 76 G/9 NW, 76 G/16 SW

1986: Prospecting Permits 1014, 1036. BRAU 24-29, 45-47. See DIAND assessment report 082114.

This area is directly southwest of the Western River, which here flows northwesterly along the Bathurst Fault. The Ellice River, which flows easterly is about 5 km southeast of the Ellice River area at its nearest point.

Work in 1986 was done at several gold showings discovered in 1985 and three target areas delineated as a result of the 1985 DIGHEM(R) survey. One or more of the following was done at each work location: reconnaissance prospecting, rock chip and rock grab sampling, grid surveying, geological mapping, and ground magnetometer and VLF EM surveying.

Results were thought sufficiently encouraging to justify further exploration, including drilling, but work was not resumed in 1987.

Boot Lake area 76 G/9 NW

1986: Prospecting Permit 1014. BRAU 30, 31. See DIAND assessment report 082114.

In 1986 work was done at gold showings discovered in 1984 and at two target areas outlined by a 1985 DIGHEM(R) survey. One or more of the following were performed at each work area: prospecting, rock chip and rock grab sampling, grid surveying, and 1:5000 scale geological mapping.

Results were adequately encouraging to justify further work including drilling.

1987: Most 1987 exploration other than diamond drilling was at the Boot Lake area. Work comprised: prospecting, 1:2000 geological mapping, rock sampling, magnetometer VLF EM and HLEM surveys, and a small amount of trenching.

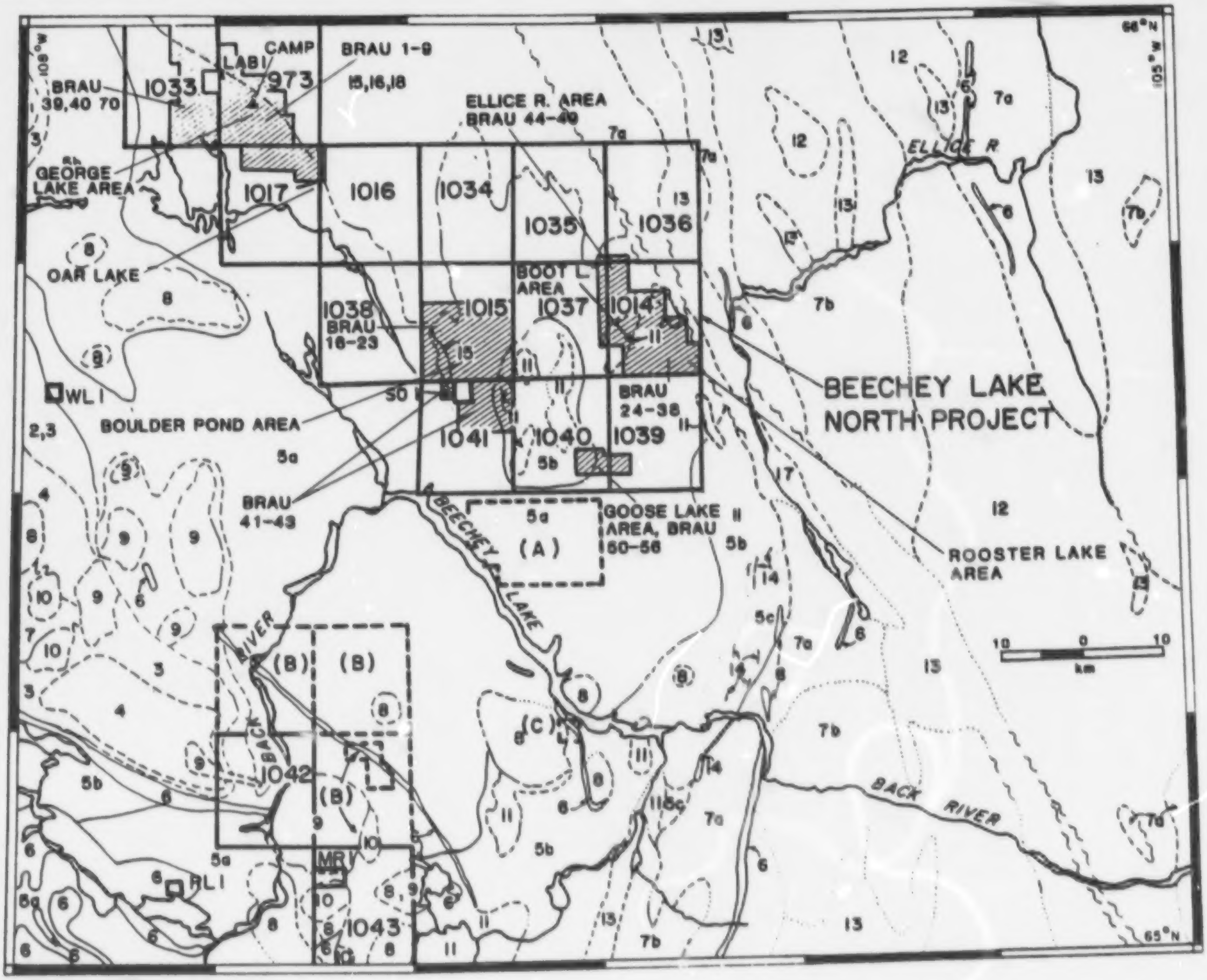

CAMP
LAB1
973
BRAU 1-9
15,16,18
BRAU 39,40 70
1033
ELLICE R. AREA BRAU 44-49
GEORGE LAKE AREA
1017
1016
1034
1035
1036
ELLICE R
OAR LAKE
BOOT L. AREA
1038
BRAU 16-23
1015
1037
1014
WL1
SO
BEECHEY LAKE NORTH PROJECT
BOULDER POND AREA
BRAU 24-38
1041
1040
1039
BRAU 41-43
GOOSE LAKE AREA, BRAU 50-56
(A)
BEECHEY LAKE
ROOSTER LAKE AREA
(B)
(C)
BACK RIVER
1042
MR1
RL1
1043
BACK RIVER
10 0 10 km
66°N
65°N
108°W
105°W

FIGURE 8-22: Back River Joint Venture property in Beechey Lake area. Geology from Frith (1981a,b).

Rooster Lake area 76 G/9 NW

1986: Prospecting Permit 1014. BRAU 31, 35-37. See DIAND assessment report 082114.

The area extends 5 km southeasterly from roughly 1 km south of "Boot Lake" to 1 km west of Rooster Lake. Three target areas, outlined by the 1985 DIGHEM(R) survey, were explored. At each, one or more of the following methods were employed: reconnaissance prospecting, rock chip and rock grab sampling, grid surveying and geological mapping.

Results were considered sufficiently encouraging to justify further exploration including drilling.

1987: In 1987 work comprised grid surveying, prospecting, rock sampling, geophysical surveys and a small amount of overburden stripping.

Goose Lake area 76 G/9 SW

1986: Prospecting Permits 1039, 1040. BRAU 50-56. See DIAND assessment report 082116.

Exploration in 1986 focused on gold showings discovered in 1984 and 1985 and on six targets delineated by the 1985 DIGHEM(R) airborne survey. At each, one or more of the following were conducted: reconnaissance prospecting, rock chip and rock grab sampling, grid surveying, geological mapping, magnetometer, VLF EM and HLEM surveys. A geochemical lodgement till sampling orientation survey was carried out in the "Goose Lake South" and "Goose Neck" areas.

Results were considered to warrant more exploration including drilling.

1987: In 1987 work comprised grid surveying, prospecting, rock sampling and geophysical surveys.

Legend for Figure 8-22

Age	Unit	Description
PROTEROZOIC	18	Gabbro
	17	Ellice River Fm: conglomerate, arkose, shale, sandstone, carbonate
	16	Burnside River Fm: pink quartzite, conglomerate, sandstone, shale, slate
	15	Western River Fm: greywacke, argillite, sandstone, carbonate, conglomerate
AGE UNCERTAIN	14	Pegmatite
	13	Gneiss and migmatite of uncertain origin, includes amphibolite, dioritic, and mylonitic granitized rocks
ARCHEAN	12	Augen K-feldspar gneiss, predominantly granodioritic
	11	Biotite muscovite granite
	8–10	REGAN INTRUSIVE SUITE
	10	tonalite, diorite, quartz diorite
	9	granite
	8	granodiorite
	7	Migmatitic gneiss and migmatite (probably derived from Yellowknife Supergroup)
	7a	biotite gneisses with 10-50% leucosomes
	7b	migmatite with more than 50% leucosomes
	6	Back Group: andesite, basalt and dacite flows, breccia and tuff
	5	BEECHEY LAKE GROUP
	5a	greywacke, mudstone, carbonaceous mudstone
	5b	prophyroblastic gneiss and schist derived from 5a
	5c	biotite gneiss with no porphyroblasts
	1–4	HACKETT RIVER GROUP
	4	dacite, metamorphosed, deformed
	3	felsic and basic flows, fragmental volcanics, volcanic sediments, iron formation
	2	andesite, basalt and dacite flows and fragmentals
	1	biotite-chlorite schist, sericitic schist, mafic amphibole gneiss and quartzofeldspathic gneiss derived from volcanogenic sediments

INDEX LAKE RECONNAISSANCE

Bow Valley Industries Ltd.	Gold
2020, 1177 W. Hastings St.	76 G/13
Vancouver, B.C., V6E 2K3	65°45'-65°55'N, 107°32'-107°58'W

REFERENCES

Frith (1981a); Seaton *et al.* (1987).
DIAND assessment report: 082070.

LOCATION

The centre of the area is 465 km northeasterly of Yellowknife on the western arm of Index Lake.

HISTORY

The area has no documented history of mineral exploration, though it is probable that airborne geophysical surveys have been flown by one or more mining companies. Adjoining areas (76 G/13 NE and 76 G/14 NW and SW) have been explored by the Back River Joint Venture as the Beechey Lake North Project since 1982 (Seaton *et al.*, 1987).

DESCRIPTION

The regional geology has been mapped at 1:31 680 by Indian and Northern Affairs and by the Geological survey of Canada. This work was compiled by Frith (1981a) into his 1:125 000 map of the Nose Lake area.

The area is underlain by Archean metasediments of the Beechey Lake Group which are intruded by two small granodiorite plutons west of Index Lake. The biotite isograd crosses Index Lake in a northwesterly to northerly direction. Metamorphic grade increases westwards with the staurolite-cordierite isograd (Frith, 1981a) passing through the western extremity of Index Lake.

CURRENT WORK AND RESULTS

In 1985 the area was explored by 1:31 680 mapping and prospecting. One outcrop of amphibolitic silicate iron formation was noted near the south shore of a small lake about 6 km northwesterly of Index Lake.

Only four samples were taken: one from pyrite- and pyrrhotite-bearing iron formation, one from a graphitic shear zone and two from rusty metasediments, all of which assayed at or below the 0.03 g/t Au detection limit of the method used.

HACKETT RIVER RECONNAISSANCE

Bow Valley Industries Ltd.	Gold
2020, 1177 W. Hastings St.	76 K/1,2
Vancouver, B.C., V6E 2K3	66°06'-66°13'N 108°33'-108°50'W

REFERENCES

Bryan *et al.* (1976); Jefferson *et al.* (1976).
DIAND assessment report: 082070.

LOCATION

The area is centred 590 km northeasterly of Yellowknife and 10 km northwest of the confluence of the Mara River and Hackett River.

HISTORY

Though adjoining ground to the south (Bathurst Norsemines property) has been intensively explored for volcanogenic silver-base metal deposits during the 1970's, relatively little work was done in the Hackett River reconnaissance area.

DESCRIPTION

The area is mainly underlain by Archean metasediments of amphibolite facies; lesser areas are underlain by felsic and intermediate volcanics and granitoid rocks. Bryan and others (1976) mapped the southern two-thirds of 76 K/1 and Jefferson and others (1976) mapped 76 K/2. Both maps were published at 1:31 680 scale.

CURRENT WORK AND RESULTS

In 1985 three days of geological mapping and prospecting were completed. Two zones of silicate iron-formation were outlined with strike lengths of 1 km and more than 2 km. They contain up to 5% pyrite and pyrrhotite, but seven grab samples assayed less than 1 g/t Au. Grab samples of pyrite- and pyrrhotite-bearing sediments, of gossans capping volcanics, and of pyritiferous graphitic sediments, did not contain anomalous amounts of gold.

REGAN LAKE SUPRACRUSTAL BELT

In the Regan Lake area, Yellowknife Supergroup metasediments fill the gap between the Back River volcanic complex and the Hackett River volcanic belt. Locally the metasediments contain iron formation, which in places is auriferous.

REGAN LAKE RECONNAISSANCE

Bow Valley Industries Ltd.	Gold
2020, 1177 W. Hastings St.	76 G/3,7
Vancouver, B.C., V6E 2K3	65°00'-65°15'N, 107°20'-108°00'W

REFERENCES

Frith (1981a); Lambert (1981); Seaton (1984); Seaton and Crux (1985); Seaton *et al.* (1987).

DIAND assessment reports: 082624, 082070.

PROPERTY

Open ground.

LOCATION

The reconnaissance area is centred 445 km northeasterly of Yellowknife and 10 km northeasterly of Regan Lake.

HISTORY

Auriferous iron formation has been the target of gold exploration in the Regan Lake area since 1946. At the time of Bow Valley's 1985 reconnaissance, parts of the area were staked as the ALGOOD 1,2 claims, the SIDD claims and the PERU claims (Seaton, 1984; Seaton and Crux, 1985; Seaton *et al.*, 1987).

Details of earlier exploration may be obtained from references given in the reports cited above.

DESCRIPTION

The area is largely underlain by metasediments, intermediate and felsic volcanics (Frith, 1981a). Except in the extreme north of the area, north of Twin Lakes, rocks are of greenschist facies.

CURRENT WORK AND RESULTS

Two areas of open ground, one west of Regan Lake and the other extending southeasterly from Twin Lakes to the Back River were explored in 1985 by geological reconnaissance and prospecting. No claims were staked as a result of this work.

FIRE AND MG CLAIMS

Argus Resources Ltd.	Gold
200, 700 4th Ave. SW	76 G/4
Calgary, Alta., T2P 3J4	65°05'N, 107°43'W

REFERENCES

Frith (1981a); Lambert (1981).

DIAND assessment reports: 082624, 082625.

PROPERTY

FIRE 1-6; MG 1-3.

LOCATION

The claims form a single block adjoining and covering parts of Fidler Lake and Regan Lake. The property is centred roughly 435 km northeasterly of Yellowknife.

HISTORY

The claims were staked to cover showings discovered in the latter part of the "Thistle and Regan Lakes Reconnaissance". They were recorded in September 1986.

More complete references to exploration in the Regan Lake area are given under "Thistle and Regan Lake Reconnaissance."

DESCRIPTION

The property covers part of a "tongue" of intermediate and locally felsic volcanics that extends northeasterly from the main body of the Back River volcanic complex for roughly 22 km and then turns southwesterly through the property area to pass between Regan and Fiddler Lakes (Frith, 1981a; Lambert, 1981). Greenschist facies metasediments flank the volcanic tongue and underlie the northeastern and southwestern margins of the property and outcrop peripheral to Regan Lake which they presumably underlie.

The metavolcanics underlying the property include pillowed and massive andesite and andesitic tuffs, lesser amounts of dacite and rarely rhyolite. Synvolcanic intrusions of gabbro underlie a small part of the property, mainly near the northwestern shore of Regan Lake.

The Yellowknife Supergroup metasediments are largely greywackes and mudstones which are in places carbonaceous.

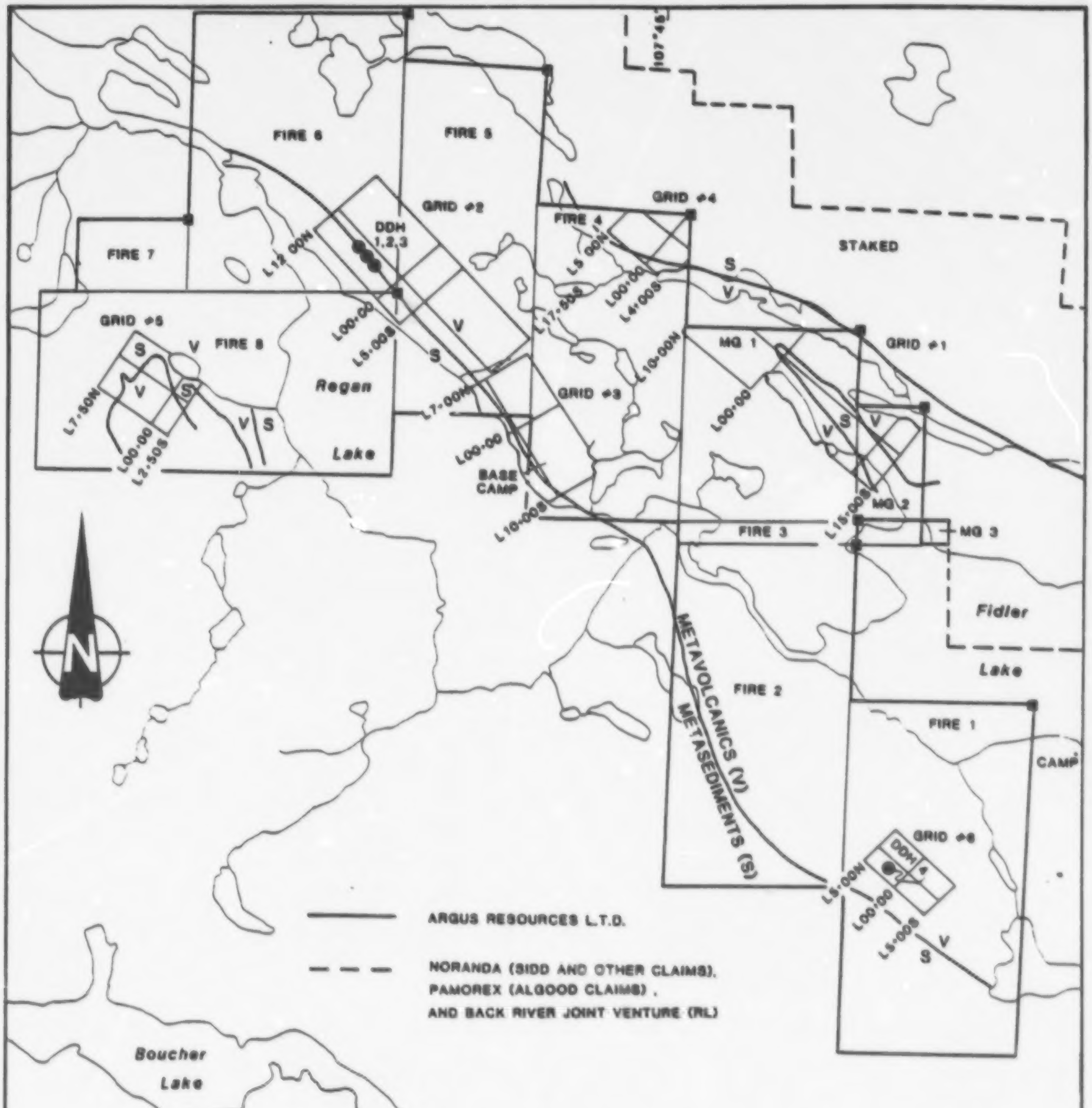

107°45'
FIRE 6
FIRE 5
GRID #2
DDH 1,2,3
GRID #4
FIRE 4
STAKED
FIRE 7
L12 00N
L5 00N
L17+50S
L00+00
L4+00S
S
V
GRID #5
V FIRE 8
S
V
S
L7+50N
L00+00
L2+50S
V S
L00+00
L5+00S
V
S
Regan
Lake
L7+00N
GRID #3
L10+00N
MG 1
GRID #1
L00+00
V S V
L00+00
BASE CAMP
L10+00S
L15+00S
MG 2
FIRE 3
MG 3
Fidler
Lake
METAVOLCANICS (V)
METASEDIMENTS (S)
FIRE 2
FIRE 1
CAMP
GRID #6
DDH 4
L5+00N
L00+00
L5+00S
S
V
ARGUS RESOURCES L.T.D.
NORANDA (SIDD AND OTHER CLAIMS),
PAMOREX (ALGOOD CLAIMS),
AND BACK RIVER JOINT VENTURE (RL)
Boucher
Lake
1000m
0
4000m
N

FIGURE 8-23: FIRE and MG claims and grids, Regan Lake area. Geology simplified from DIAND assessment reports 082624 and 082625.

CURRENT WORK AND RESULTS

In 1987 six grids were constructed on the FIRE and MG claim block (Fig. 8-23). The grids cover areas with anomalous gold concentrations discovered during 1986 regional reconnaissance. Five of the grids are at the contact between metavolcanics and metasediments. The sixth (Grid 6 on FIRE 1) is underlain largely by metavolcanics.

All six grids were explored by geological mapping, magnetometer and VLF EM surveys. Soil sampling was done on Grids 1, 2 and 4. The grids were mapped at 1:2500 scale and a small part of Grid 1 was also mapped at 1:1000.

Geophysical surveys outlined well defined conductors on Grids 1, 2, 3 and 6 that are locally coincident with magnetic anomalies as on Grid 3. These coincident anomalies are evidently caused by iron formation. Other VLF EM conductors appear to be related to faults as on Grid 1. Magnetic anomalies can be related to diabase dykes as well as oxide iron formation as on Grid 1 and Grid 4.

Four diamond drill holes totalling 191 m were completed. Three holes drilled on Grid 2 to test a VLF EM conductor and associated magnetic high intersected metasediments and metavolcanics. The hole drilled on Grid 6 intersected mainly metavolcanics. Core samples returned low assays for gold.

CONTWOYTO RIVER METASEDIMENTARY BELT

This metasedimentary belt encompasses Ghurka, Migration and Thistle Lakes, at the southeastern end of Contwoyto Lake and extends southeasterly along the western margin of the Back River volcanic complex.

MUSKOX CLAIMS

Argus Resources Ltd.	Gold
200, 700 4th Ave. SW	76 C/15; 76 F/2
Calgary, Alta., T2P 3J4	65°02'N, 108°40'W

REFERENCES

Frith (1981a); Lord and Barnes (1954).
DIAND assessment reports: 082624, 082625.

PROPERTY

MUSKOX 1-6.

LOCATION

The claims are at "Esker Lake", 3 km north of Thistle Lake and 400 km northeasterly of Yellowknife.

HISTORY

The area, at the southeastern end of Contwoyto Lake (Ghurka, Migration and Thistle Lakes area) has not undergone much previous exploration (see Thistle and Regan Lakes Reconnaissance).

The MUSKOX 1-6 claims were recorded in September, 1986.

DESCRIPTION

The regional geology has been mapped by Frith (1981a) at 1:125 000 and south of latitude 65°N by Lord and Barnes (1954) at 1:253 440.

According to Frith (1981a), the staurolite-cordierite isograd passes through the eastern part of Esker Lake with higher grade rocks to the west.

CURRENT WORK AND RESULTS

In 1987 three adjoining grids (Fig. 8-24) were constructed south of "Esker Lake" on MUSKOX 2, 3, 4 and 6 claims. These grids were explored by 1:2500 geological mapping, magnetometer and VLF EM surveys. Soil samples collected from the western part of Grid 1 were analysed for gold and arsenic.

Rocks exposed on the grids include metasediments of the Yellowknife Supergroup, including biotite schist ± cordierite ± andalusite ± anthophyllite ± garnet. A broad zone of "garnet amphibolite" mapped as extending northeasterly from Grid 3 across Grid 1 and crossed by a VLF EM conductor coincident with a series of magnetic highs is probably in part a tightly folded mainly silicate iron formation with an overall northwesterly trend. Comparable VLF EM conductors and magnetic anomalies associated with amphibolite are found on Grid 2.

Small bodies of tonalite or diorite and granitic dykes intrude the Yellowknife Supergroup metasediments.

Three shallow trenches were excavated towards the eastern end of Grid 1, near "Shelt Lake", a 1.5 km-long lake in the southeastern corner of MUSKOX 4 claim. The trenches, excavated in sulphide-rich amphibolite, straddle the main VLF EM conductor and an associated magnetic anomaly. The highest gold assay, 60 g/t Au, was from a trench sample containing 1.01% As. The rock sampled is described as a quartz-flooded amphibolite, with quartz forming 10-20% of the rock and a black fine- to medium-grained matrix of bladed and acicular amphibole crystals. Sulphides (mainly pyrrhotite and arsenopyrite) formed 25-30% of the rock, with the pyrrhotite banded or in blebs.

The showing is hosted by metamorphosed silicate iron formation cut by quartz veins. However these cross-cutting quartz veins do not show any halo of wall rock alteration, manifested either by alteration of grunerite to hornblende adjacent to the veins or by concentration of arsenopyrite in the vicinity of the cross-cutting quartz veins, as is seen at Lupin Mine. Pockets or layers of arsenopyrite-rich rock in which coarse arsenopyrite crystals form 50% or more of the rock were noted, but these have no obvious spatial relationship to individual cross-cutting quartz veins.

The iron formation is locally garnetiferous. A felspathic rock with scattered biotite flakes a few metres from the showing is probably a dacitic tuff.

THISTLE AND REGAN LAKES RECONNAISSANCE

Argus Resources Ltd.	Gold
200, 700 4th Ave. SW	76 C/15; 76 F/1,2;
Calgary, Alta., T2P 3J4	76 G/4,7,8
	64°52'-65°20'N
	107°30'-109°00'W

REFERENCES

Frith (1981a); Frith and Hill (1975); Frith and Percival (1978); Lambert (1978, 1981); Lord and Barnes (1954); Seaton and Crux (1985); Seaton *et al.* (1987).

DIAND assessment reports: 017133, 017134, 017138, 017142, 017157, 017160, 080073, 080178, 080232, 080293, 080452, 080476, 080571, 081136, 081610, 081789, 081812, 081909.

PROPERTY

FIRE 1-8; MG 1-3; MUSKOX 1-6; Q 1; WASP 1, 2.

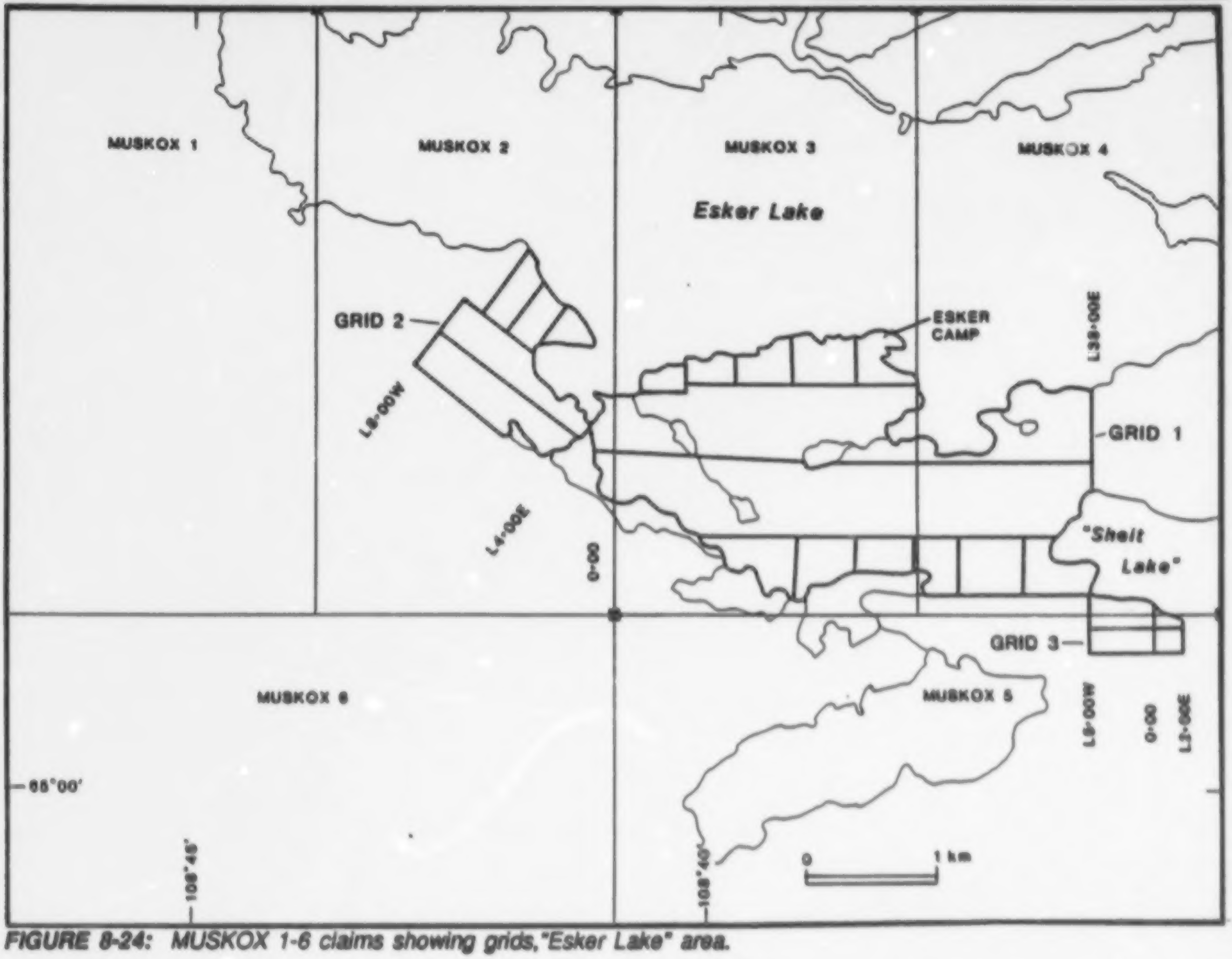


FIGURE 8-24: MUSKOX 1-6 claims showing grids,"Esker Lake" area.

LOCATION

The area reconnoitred is 390 km to 420 km northeasterly of Yellowknife. It extends 50 km from north to south and 70 km from east to west. The claims recorded during the reconnaissance are:

Claims	NTS	Latitude	Longitude
FIRE 1-8	76 G/4	65°05'N	107°45'W
MG 1-3	76 G/4	65°05'N	107°42'W
MUSKOX 1-6	76 C/15, 76F/2	65°02'N	108°40'W
Q 1	76 F/1	65°04'N	108°02'W
WASP 1,2	76 F/1,2	65°01'N	108°29'W

The FIRE, MG and MUSKOX claims are shown in Figures 8-23 and 8-24.

HISTORY

The Regan Lake area, in the eastern part of the area reconnoitred, has been extensively explored for gold and base metals since the 1940's. The history of exploration is detailed in the numerous assessment reports cited. Major companies involved in this exploration were Falconbridge Nickel Mines Ltd., Teck Corporation Ltd., Du Pont of Canada Exploration Ltd., Giant Yellowknife Mines Ltd. and Noranda Exploration Company Ltd. (SIDD claims, Seaton and Crux, 1985; Seaton *et al.*, 1987).

The western part of the reconnaissance area has been relatively little explored and only three of the assessment reports listed (080476, 080571, 080293) describe exploration in the Thistle Lake area (76 F/1 and 76 C/15). Bow Valley Industries Ltd. explored part of the western margin of the Back River volcanic complex.

FIRE 1-8, MG 1-3, MUSKOX 1-6, Q 1, WASP 1,2 were recorded in September 1986.

DESCRIPTION

The property is underlain mainly by: Yellowknife Supergroup metasediments ranging from greenschist to amphibolite grade; metavolcanics of the Back River volcanic complex and, along the area's northwestern margin, of the Hackett River volcanic belt; and several granitoid plutons which are generally ovoid in surface outline with maximum diameters of as much as 15 km. The Yellowknife Supergroup sediments are mainly greywacke-siltstone metaturbidites that are more highly metamorphosed in the western part of the area explored.

The Yellowknife Supergroup metasediments contain thin units of iron formation with local concentrations of arsenopyrite, pyrite and/or pyrrhotite. Such sulphidic iron formation is in places auriferous.

North of latitude 65°N the area has been mapped by Frith (1981a) at 1:125 000 and to the south by Lord and Barnes (1954) at 1:253 440. Lambert (1978, 1981) mapped the Back River volcanic complex.

CURRENT WORK AND RESULTS

The area was explored by reconnaissance geological mapping, rock and soil sampling. All samples (759 rock and 123 soil) were analysed for gold and arsenic.

Anomalous concentrations of gold were found in a variety of host rocks: intermediate to felsic volcanics, amphibolites, quartz-plagioclase-biotite-hornblende gneiss, biotite schist, gabbro and diorite, commonly in quartz-filled fractures with pyrite ± arsenopyrite ± pyrrhotite ± chalcopyrite. Selected areas were staked as a result of this work.

Petrographic studies were done on a few samples.

THISTLE LAKE AREA

Bow Valley Industries Ltd.	Gold
2020, 1177 W. Hastings St.	76 B/13; 76 C/16; 76 F/1
Vancouver, B.C., V6E 2K3	64°51'-65°03'N
	108°00'-108°30'W

REFERENCES

Lambert (1978, 1981); Lord and Barnes (1954); Seaton (1983a).

DIAND assessment report: 082070.

PROPERTY

BACK 1-5; BOW 1; GOOFY 1; JB 1-3; LOR 1-7; RING 1, 2, 3, 4.

LOCATION

The area is centred about 410 km northeasterly of Yellowknife.

HISTORY

Claims BOW 1, JB 1, 3 (Fig. 8-25), NTS sheets 76 C/16 and 76 F/1, were recorded in September, 1985 - BOW 1 to cover auriferous arsenopyrite-rich silicified and altered zones in mafic volcanics, and JB 1 and JB 3 to south and north of BOW 1 to secure possible on-strike extensions of these zone. The BACK, GOOFY, LOR and RING 1, 2 claims, and possibly RING 3, 4 on NTS sheet 76 B/13, were staked later in the summer of 1985 as a sequel to regional reconnaissance in the Thistle Lake area , and were recorded in December, 1985.

DESCRIPTION

The area reconnoitred extends along more than two-thirds of the southwestern margin of the Back River volcanic complex. Bow Valley Industries' claims staked along this margin form a continuous block which extends roughly 35 km northwesterly from Thlewycho Lake, where (in 1985) the property adjoined Cominco's FACE claims. The FACE claims adjoin the PALE claims where Cominco drilled a silver-lead-zinc showing in rhyolite in 1978.

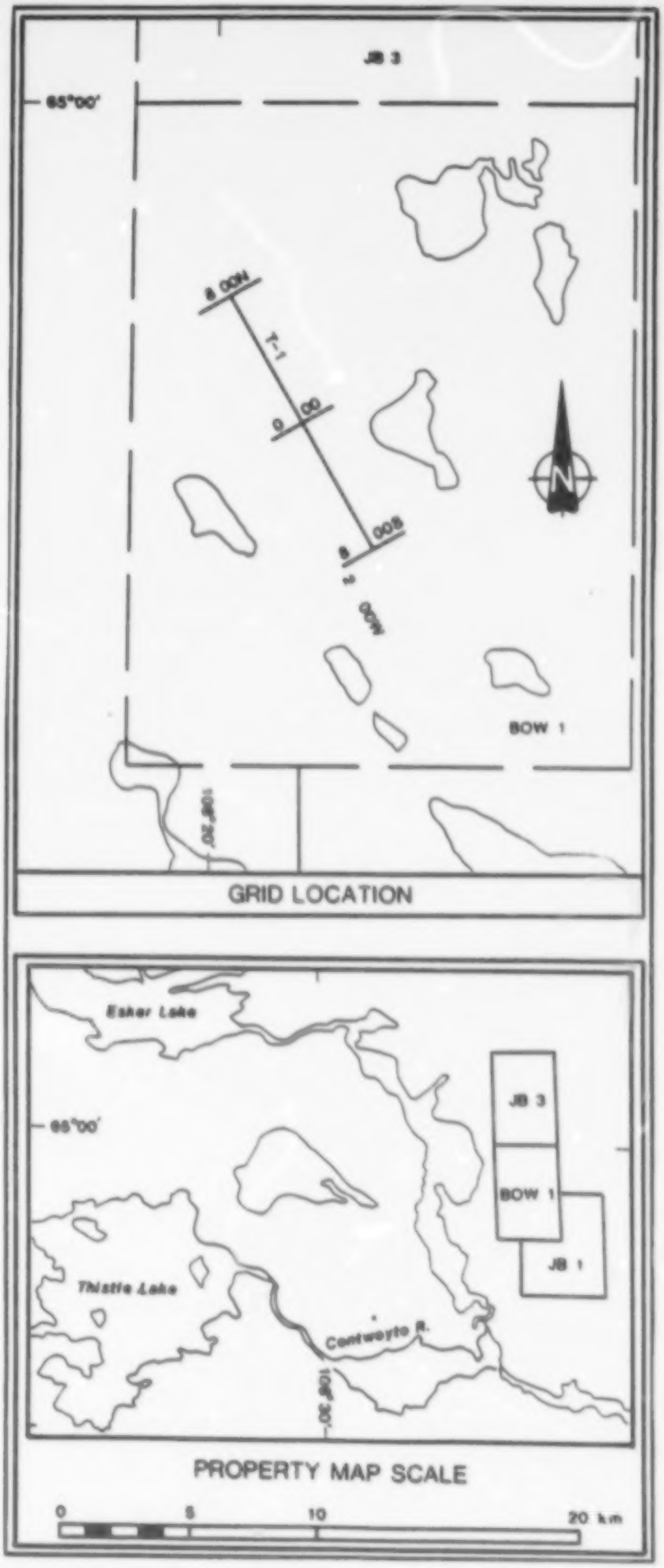


FIGURE 8-25: BOW 1 and JB 1,3 claims and grid, Thistle Lake area.

CURRENT WORK AND RESULTS

Regional geological reconnaissance and prospecting of the Thistle Lake area in 1985 was accompanied by 1:2 000 geological mapping, magnetometer and VLF EM surveys of a grid constructed over the BOW 1 claim auriferous zone (Fig. 8-25). In 1986, Welcome North Mines Ltd. became operator and a joint venture partner with Bow Valley Industries. They continued to explore the property by geological mapping, prospecting and by excavating several trenches on the BOW 1 claim. Though in one trench an assay of 16 g/t Au across 2 m was obtained, other trench samples gave much lower gold assays and the project was discontinued.

Gold is hosted by lensoid bodies of arsenopyrite-, pyrite-, and pyrrhotite-bearing silicate-facies iron formation in mafic to intermediate volcanics, at or near their contact with overlying metaturbidites.

POINT LAKE - ITCHEN LAKE - CONTWOYTO LAKE METASEDIMENTARY BELT

This belt of metasediments of the Contwoyto and the Itchen formations (Bostock, 1980), describes a northward convex arc on the northern side of the Central volcanic belt (also known unofficially as the Olga Lake volcanic belt).

The Contwoyto Formation, which contains amphibolite (metamorphosed iron formation) zones and lenses, is to the north, east and west of the Itchen Formation which generally contains no such amphibolite bodies. The areas underlain by Contwoyto Formation metasediments have been extensively staked for the gold potential of the amphibolite zones.

BUTTERFLY LAKE PROJECT

Cominco Ltd.	Gold
Suite 700, 409 Granville St.	76 E/10
Vancouver, B.C., V6C 1T2	65°30'30"-65°38'N
	110°27'-111°04'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976); Seaton and Crux (1985); Seaton, Brophy and Crux (1987).

DIAND assessment reports: 017119, 017120, 017132, 017167, 081735, 081757, 081170, 081942, 081943, 081944, 081945, 081951, 081952, 082094, 082105, 082361, 082520, 082545.

PROPERTY

AU 15, 19, 23, 24, CTL 1, DIGGER 1, 2, JON 1-13, NC 1, DTC 1, SAM 1, 2.

LOCATION

"Butterfly Lake", so called on account of an esker which splits it into two wings joined by a narrow channel, is mainly encompassed by AU 24 (Fig. 8-26) 395 km northeasterly of Yellowknife and 3 km southeasterly of Lupin Mine. The centre of Butterfly Lake is roughly 4 km east of Contwoyto Lake.

HISTORY

Prospecting Permit 33 (76 E/10) was granted to Canadian Nickel Company Ltd. in 1962. An aeromagnetic survey was done over the permit area in 1962. Follow-up geological and geophysical surveys over grids were done from 1962 to 1964. The permit lapsed in 1964 (DIAND assessment reports: 017119, 017120, 017167; Seaton, Brophy and Crux, 1987).

AU 15, 18 and 19 were recorded by G. Sage in February 1981, transferred to Shell Canada Resources in March 1981, and to Highwood Resources Limited in January 1983. In February 1983, Highwood Resources transferred the claims to Amhawk Resource Corporation, which in September 1985 transferred them to Cominco Limited.

AU 23 and AU 24 were recorded by G. Sage and transferred to Shell Canada Resources Limited in February 1981. In January 1983, Shell Canada Resources transferred the claims to Highwood Resources Limited, which in April 1984 transferred them to Westsun Petroleums and Minerals Limited. Westsun returned the claims to Highwood in May 1985, which in August 1985 transferred them to Cominco.

Cominco recorded CTL 1 in March 1983. DIGGER 1 was recorded and transferred to D.G. Thomas in March 1983. The following month it was transferred to Cominco.

NC 1 was recorded by P. Hungle in March 1983 and transferred to D.G. Thomas the following July. In August 1983 it was transferred to Wellington Resources Limited, which in February 1984 became Gyro Energy and Minerals Corporation. After completing geological and geophysical surveys of a grid on NC 1 in 1983 (DIAND assessment report 081757), Gyro transferred the claim to Cominco in June 1985. The history of PTC 1 is the same as that of NC 1 except that assessment work was not filed until after transfer to Cominco.

SAM 1 and 2 were recorded by P. Hungle in March 1983, transferred to Roxwell Gold Mines in February 1984. Roxwell transferred the claims to Cominco in April 1985.

The JON claims were staked for Cominco Limited: JON 1, 2 in August 1985, JON 3, 4 in December 1985, JON 5, 6 in September 1986, JON 7-11 in July 1987 and JON 12, 13 in October 1987.

With the exception of the CTL 1 and JON claims that were staked for Cominco, most claims were not acquired by Cominco until 1985, and although numerous transfers had taken place, only in the case of the NC 1 claim was assessment work filed prior to acquisition by Cominco. Cominco's work is detailed in the numerous assessment reports cited and briefly summarised in Seaton and Crux (1985) and Seaton, Brophy and Crux (1987).

The large block of claims staked and otherwise acquired by Cominco is currently being explored by Cominco Limited and Cogema Canada Ltd. in joint venture.

DESCRIPTION

The property is underlain primarily by Archean metasediments of the Yellowknife Supergroup with lenses of garnet- and amphibole-rich iron formation. Granitic and diabase dykes, generally northwesterly trending, intrude the sediments which also have an overall northwesterly strike though less northerly than the dykes. The region has been mapped by Fraser (1964), Tremblay (1976) and Bostock (1980) at 1:506 880, 1:50 000 and 1:250 000 respectively. It is under ongoing study by the Geological Survey of Canada (King *et al.*, 1988).

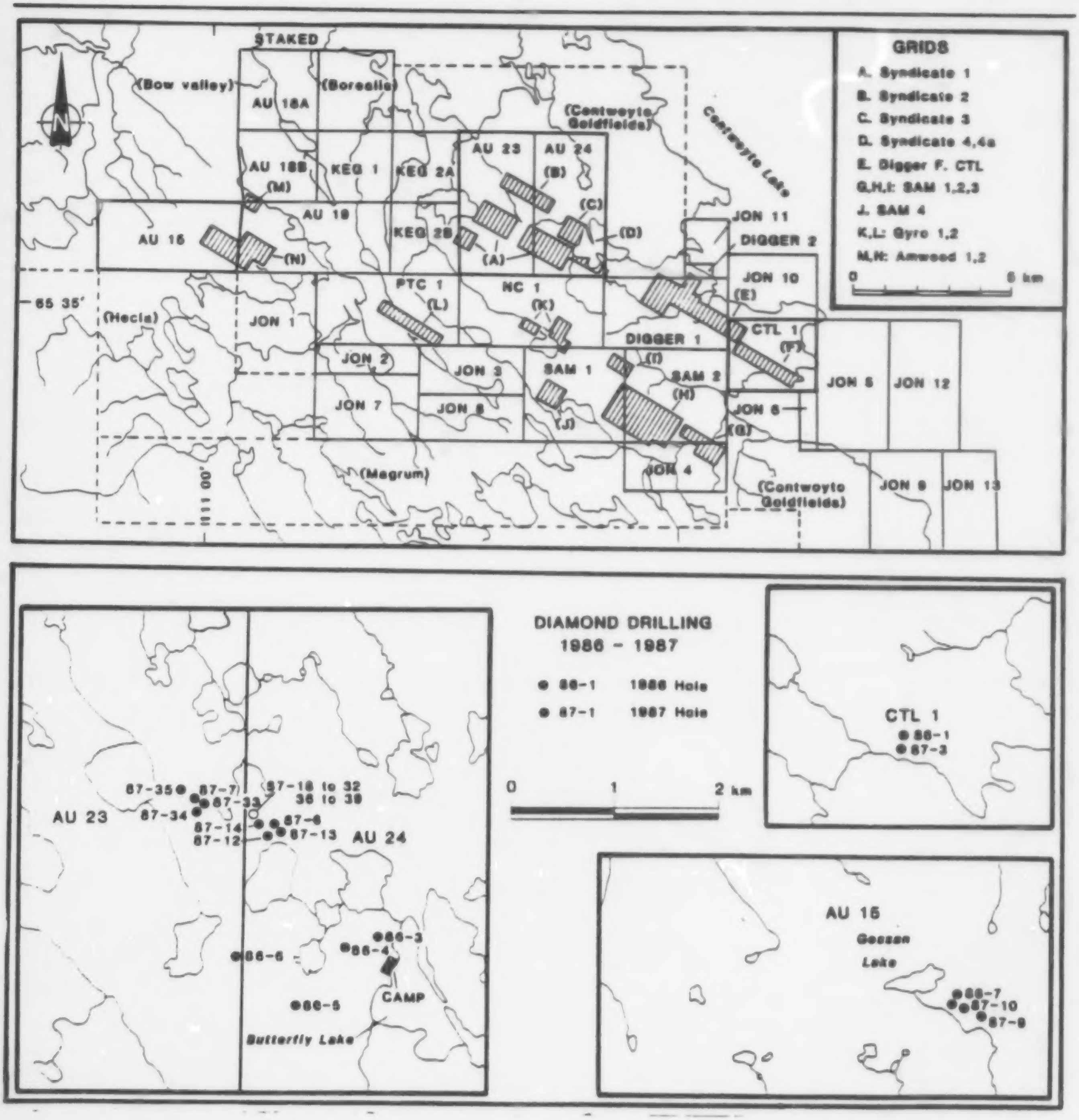

STAKED
(Bow valley)
(Borealis)
AU 18A
AU 18B
(M)
KEG 1
KEG 2A
AU 23
AU 24
(B)
(C)
(D)
(Contwoyto Goldfields)
Contwoyto Lake
AU 15
AU 19
(N)
KEG 2B
(A)
JON 11
DIGGER 2
JON 10
(E)
65 35'
(Hecla)
JON 1
PTC 1
(L)
NC 1
(K)
DIGGER 1
CTL 1
(F)
JON 2
JON 3
SAM 1
(I)
SAM 2
(H)
JON 5
JON 12
JON 7
JON 8
(J)
JON 6
(G)
JON 4
111 00'
(Magrum)
(Contwoyto Goldfields)
JON 9
JON 13
GRIDS
A. Syndicate 1
B. Syndicate 2
C. Syndicate 3
D. Syndicate 4,4a
E. Digger F. CTL
G,H,I: SAM 1,2,3
J. SAM 4
K,L: Gyro 1,2
M,N: Amwood 1,2
0
5 km
DIAMOND DRILLING
1986 - 1987
● 86-1 1986 Hole
● 87-1 1987 Hole
0
1
2 km
AU 23
AU 24
87-35
87-7
87-33
87-34
87-18 to 32
36 to 39
87-6
87-14
87-12
87-13
86-3
86-4
86-6
86-5
CAMP
Butterfly Lake
CTL 1
86-1
87-3
AU 15
Gossan
Lake
86-7
87-10
87-8

FIGURE 8-26: "Butterfly Lake" area, AU, CTL, DIGGER and other claims; grids and diamond drill holes.

CURRENT WORK AND RESULTS

In 1986 geophysical, geological and geochemical surveys were conducted on several grids and 12 holes were drilled. The grids are shown in Figure 8-26. Table 8-4 shows the nature and amount of geophysical surveying done on each grid.

A total of 1002 m in 13 holes was drilled in 1986. Of these, one hole was abandoned at 17 m and redrilled. The distribution of these diamond drill holes between the various grids is shown in Figure 8-26.

In 1987, 14 diamond drill holes were completed (Fig. 8-26). Encouraging intersections of auriferous core on the AU 23 and 24 claims northwesterly of Butterfly Lake has spurred further exploration, including drilling.

TABLE 8-4: SUMMARY OF 1986 WORK ON BUTTERFLY LAKE PROJECT

Grid	Claim(s) Covered	Lines Line-km	HLEM Line-km	Magnetics Line-km
Amwood 1	AU-19	3.2	2.4	2.8
Amwood 2	AU-15, AU-19	12.0	9.3	9.9
Ctl	CTL	19.0	13.0	16.0
Digger	DIGGER 1	17.0	10.0	14.8
Gyro 1	NC-1	7.5	4.5	6.5
Gyro 2	PTC-1	9.5	7.0	8.0
Sam 1	SAM-2, JON-4	7.0	4.4	5.6
Sam 2	SAM-1, SAM-2	31.0	20.5	29.0
Sam 3	AU-23	3.5	2.3	2.5
Sam 4	SAM-1	7.0	4.4	5.6
Syndicate 1	AU-23, AU-24	24.0	10.0	20.1
Syndicate 2	AU-24	6.6	4.5	5.2
Syndicate 3	AU-23	4.0	3.0	3.3
TOTALS		148.3	93.2	126.4

In addition, soil sampling was done on the AMWOOD 1 and 2, DIGGER, SAM 1, 2 and 3 and 4, and the SYNDICATE 1 and 2 grids though details and results of this work were not reported.

ISLAND CLAIM

Highwood Resources Ltd.	Gold
1660, 540 5th Ave. SW	76 E/10
Calgary, Alta., T2P OM2	65°42'20"N
	110°56'20"W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976).

DIAND assessment reports: 017119, 017120, 017167, 082583.

PROPERTY

ISLAND.

LOCATION

The ISLAND claim covers most of an island in Contwoyto Lake, 400 km northeasterly of Yellowknife and 15 km southeasterly of Lupin Mine.

HISTORY

Canadian Nickel Company Ltd. acquired Prospecting Permit 33 covering 76 E/10 in 1962 and from 1962 to 1964 explored it for gold (DIAND assessment reports: 017119, 017120, 017167). In the southern part of the island now staked as the ISLAND claim, a sample taken adjacent to a diabase dyke assayed 13 g/t Au. This showing and a small surrounding area in the south of the island was covered by a grid on which geological mapping and a magnetometer survey were done in 1964.

Little exploration was done in the area until 1982 when the opening of Lupin Mine and a concurrent renewal of interest in gold exploration resulted in a staking rush in the Contwoyto Lake area.

M. Senkiw recorded the ISLAND claim in November 1983 and transferred it to Highwood Resources Limited in January 1984.

DESCRIPTION

The area was geologically mapped at 1:506 880 by Fraser (1964) as part of a regional helicopter supported reconnaissance. The adjoining area west of longitude 111°W was mapped at 1:50 000 (Tremblay, 1976) and Tremblay's mapping is included in the larger area mapped by Bostock (1980) at 1:250 000.

The ISLAND claim is probably largely underlain by Yellowknife supergroup metasediments intruded by north-northwesterly trending diabase dykes of the Mackenzie Swarm. Most bedrock on the ISLAND claim is covered by glacial deposits, however.

CURRENT WORK AND RESULTS

In 1987 work was performed by Aber Resources Limited by agreement with Highwood Resources Limited. A grid was constructed across the entire ISLAND claim and surveyed by magnetometer and horizontal loop EM.

The total field magnetometer survey outlined three anomalies that were attributed to diabase dykes. Two elongate but shorter anomalies are unexplained.

ROX VOX PROJECT

Parklane Technologies Ltd.	Gold
c/o Taiga Consultants Ltd.	76 E/10
Suite 400	65°40'N, 110°56'W
534 17th Ave. SW	
Calgary, Alta., T2S OB1	

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).

DIAND assessment reports: 017120, 017167, 082241, 082527.

PROPERTY

ROX 1; VOX 1.

LOCATION

The claims (Fig. 8-27) are 395 km northeasterly of Yellowknife and cover most of a small peninsula on the west shore of Contwoyto Lake at the mouth of Shallow Bay.

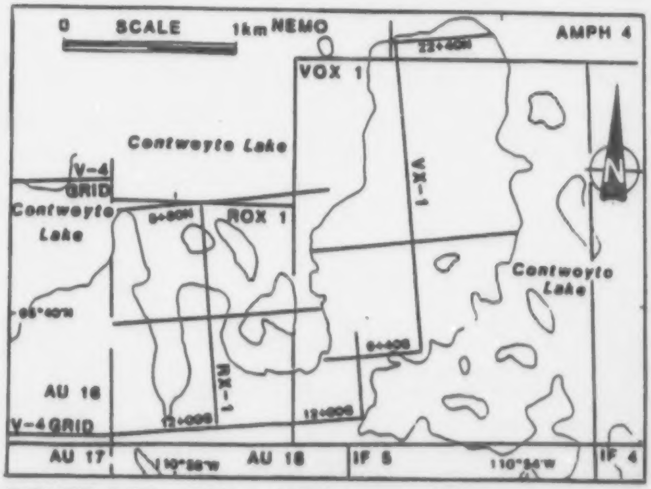


FIGURE 8-27: ROX 1, VOX 1 and grids.

HISTORY

From 1962 to 1964 Canadian Nickel Company Limited mapped and explored their Prospecting Permit 33 which covered NTS 76 E/10 (DIAND assessment reports: 017120, 017167). Following a 1962 airborne magnetometer survey, grids were constructed over a number of anomalies, which were then tested by ground geophysical surveys. These included a magnetometer survey of a grid in the northern part of the area later staked as VOX 1. Canadian Nickel Company tested an amphibolitic zone on this grid by three diamond drill holes, for which gold assays were not reported.

ROX 1 and VOX 1 were recorded by D.G. Thomas in March 1983, and optioned to Parklane Explorations Inc. in October 1986. In September 1986 the company became Parklane Technologies Limited.

DESCRIPTION

The only published map covering the area is in Fraser (1964) at a reconnaissance scale of 1:506 880. More detailed mapping at 1:250 000 (Bostock, 1980) and 1:50 000 (Tremblay, 1976) cover adjoining areas to the west. The ROX 1 and VOX 1 claims are largely underlain by Archean metaturbidites which locally contain silicate (locally sulphidic) iron formation units. The pelitic component of the metasediments is metamorphosed to cordierite-biotite schist. The metasediments are cut by numerous north-northwesterly trending Helikian diabase dykes of the Mackenzie Swarm.

CURRENT WORK AND RESULTS

In 1986 the project was managed by Covello Consulting of Yellowknife. Focusing on auriferous iron formation, grids were constructed with north oriented baselines, covering almost all of the dry land parts of ROX 1 and VOX 1. Both ROX 1 and VOX 1 grids were explored by VLF EM, total field magnetic and magnetic gradient surveys. The VOX 1 grid was geologically mapped at 1:2 500. Extensive overburden on the ROX 1 grid obscures bedrock geology.

Eight geophysical anomalies were outlined on the ROX 1 grid, and five major anomalous zones on VOX 1. Mapping shows those on VOX 1 to be coincident with zones of iron formation which are commonly complexly folded. Magnetic anomalies locally coincide with zones of iron formation, though much stronger and more persistent magnetic features are caused by diabase dykes. VLF EM conductors on the ROX 1 grid trend northerly. On the VOX grid two conductors that trend northeasterly coincide with anomalous magnetic trends and iron formation zones. Thirty-nine samples of iron formation from the VOX 1 grid yielded disappointing gold assays. In 1987 Taiga Consultants Limited operated the exploration. Detail "fill-in" grids with 40 m line separation and station spacing were constructed over the geophysical anomalies delineated in 1986. Soil geochemical sampling for gold was completed on each detail grid. Detail grids and certain areas on strike from anomalous geophysical trends were tested by prospecting and lithogeochemical sampling. Of 190 rock samples collected, only three were from the ROX 1 claim. Seven rock samples contained more than 500 ppb Au; five of these were from one anomaly. Three soil samples from the ROX 1 grid contained more than 50 ppb Au. A VLF EM survey on two detail grids on VOX 1 did not outline any conductors.

AU 15

Cominco Ltd.
Suite 700, 409 Granville St.
Vancouver, B.C., V6C 1T2

Gold
76 E/10,11
65°36'N, 111°01'W

REFERENCES

Bostock (1980); Tremblay (1976); Seaton and Crux (1985); Seaton *et al.* (1987).

DIAND assessment reports: 018870, 018951, 018952, 082524.

PROPERTY

AU 15.

LOCATION

The AU 15 claim (Figs. 8-26, 8-28) is 390 km northeasterly of Yellowknife and 7 km south of Shallow Bay, Contwoyto Lake.

HISTORY

AU 15 was recorded in February 1981. Cominco optioned the claim from Amhawk Resources Limited in 1985. A more detailed historical summary may be found in Seaton and Crux (1985) and Seaton *et al.* (1987). A record of work done on the AU 15 claim and adjoining claims is in the assessment reports cited.

DESCRIPTION

The area has been mapped at 1:250 000 by Bostock (1980), by Tremblay (1976) at 1:50 000 and Fraser (1964) at 1:506 880.

The claim is underlain by metaturbidites of the Contwoyto Formation. The more pelitic parts are nodular quartz-plagioclase-biotite schists with cordierite, andalusite and staurolite porphyroblasts. Lenses of amphibolitic locally garnetiferous or sulphidic silicate facies iron formation are in the Contwoyto Formation metasediments. Gold is associated with sulfide-bearing iron formation. A small pluton of granite intrudes the metasediments in the southern part of AU 15. Northwesterly

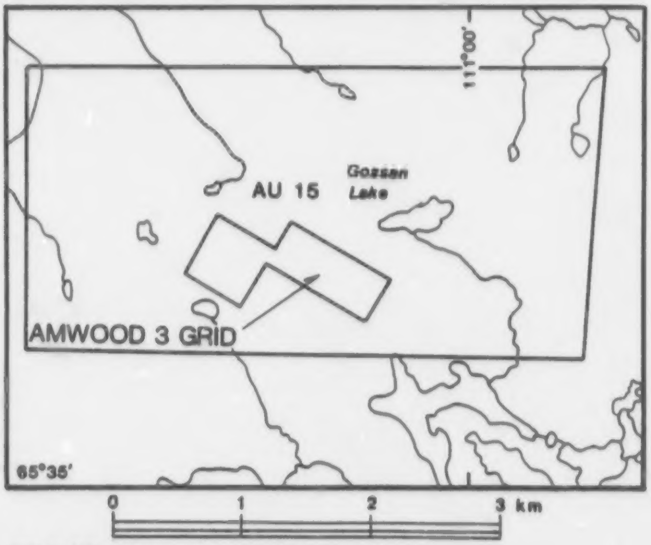


FIGURE 8-28: AU 15 claim and grid.

trending diabase dykes of the Mackenzie Swarm cut all other rock units.

CURRENT WORK AND RESULTS

In 1987 horizontal loop EM and total field and magnetic gradient magnetometer surveys were conducted on the Amwood Grid in the south-central part of AU 15 (Fig. 8-28).

BUCKET, IF, AND JEMIMA CLAIMS

Contwoyto Goldfields Ltd.	Gold
c/o Fair and Weir	76 E/10,11
Suite 1660,	65°31'-65°40'N
444 5th Ave. SW	110°32'-111°04'W
Calgary, Alta., T2P 2T8	

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976).

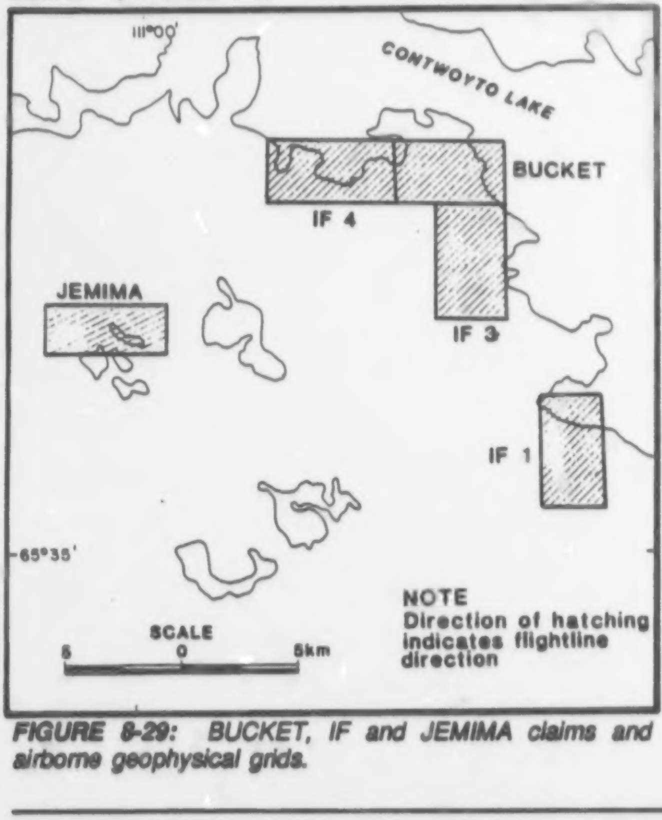
DIAND assessment reports: 017119, 017120, 017132, 017167, 017206, 082122, 082123, 082124, 082125, 082126, 082127.

PROPERTY

BUCKET 1; IF 1, 3, 4; JEMIMA 1.

LOCATION

The claims (Fig. 8-29) are from 385 km to 400 km northeasterly of Yellowknife. All, except JEMIMA 1, are on the southwestern shore of Contwoyto Lake. The claims cover three discrete areas, the largest of which is that covered by BUCKET 1, IF 3 and IF 4.



NOTE
Direction of hatching indicates flightline direction

FIGURE 8-29: BUCKET, IF and JEMIMA claims and airborne geophysical grids.

HISTORY

Canadian Nickel Company Limited acquired Prospecting Permit 33, covering 76 E/10 in 1962 and from 1962 to 1964 explored it for gold as detailed in DIAND assessment reports 017119, 017120 and 017167. In the vicinity of JEMIMA 1 and to its north in the Gossan Lake area (currently staked as AU 15) Roberts Mining Company did geological mapping and geophysical surveys (DIAND assessment reports: 017132, 017206) on the DUD, HAR and other claim groups in 1962 and 1963. IF 1, 3 and 4 were recorded by M. Magrum in September 1983. The IF claims were transferred to 305314 Alberta Limited, which in February 1986 transferred ownership to its successor Contwoyto Goldfields Limited.

BUCKET 1 was recorded by B. Weir in September 1985. In November 1985 B. Weir transferred the claim to G. Thomas, who in December 1985 transferred it to 305314 Alberta Limited. In February 1986 BUCKET 1 was transferred to Contwoyto Goldfields Limited.

JEMIMA 1 was recorded by G. Thomas in October 1984, transferred to 305314 Alberta Limited in December 1985 and transferred to Contwoyto Goldfields Limited in February 1986.

DESCRIPTION

The claims are underlain mainly by Archean metasediments of the Contwoyto Formation cut by numerous northwesterly trending diabase dykes of the Mackenzie Swarm. Locally the metasediments contain lenses and zones of garnet- and/or amphibole-rich iron formation.

West of longitude 111°W the area has been mapped by Fraser (1964), Tremblay (1976) and Bostock (1980) at 1:506 880, 1:50 000 and 1:250 000 respectively and is under ongoing study by the Geological Survey of Canada (King *et al.*, 1988).

East of longitude 111°W the area has been geologically mapped at 1:506 880 (Fraser, 1964), and Prospecting Permit 33 (NTS 76 E/10) was mapped at a more detailed scale by Canadian Nickel Company in 1962 (DIAND assessment report 017119).

CURRENT WORK AND RESULTS

In 1986 the three areas were explored by helicopter-borne geophysical surveys (DIGHEM III). Conductors were delineated on all claims. The most obvious magnetic features are caused by northwesterly trending diabase dykes of the Mackenzie Swarm. The surveys are reported and results interpreted in DIAND assessment reports 082122 to 082127.

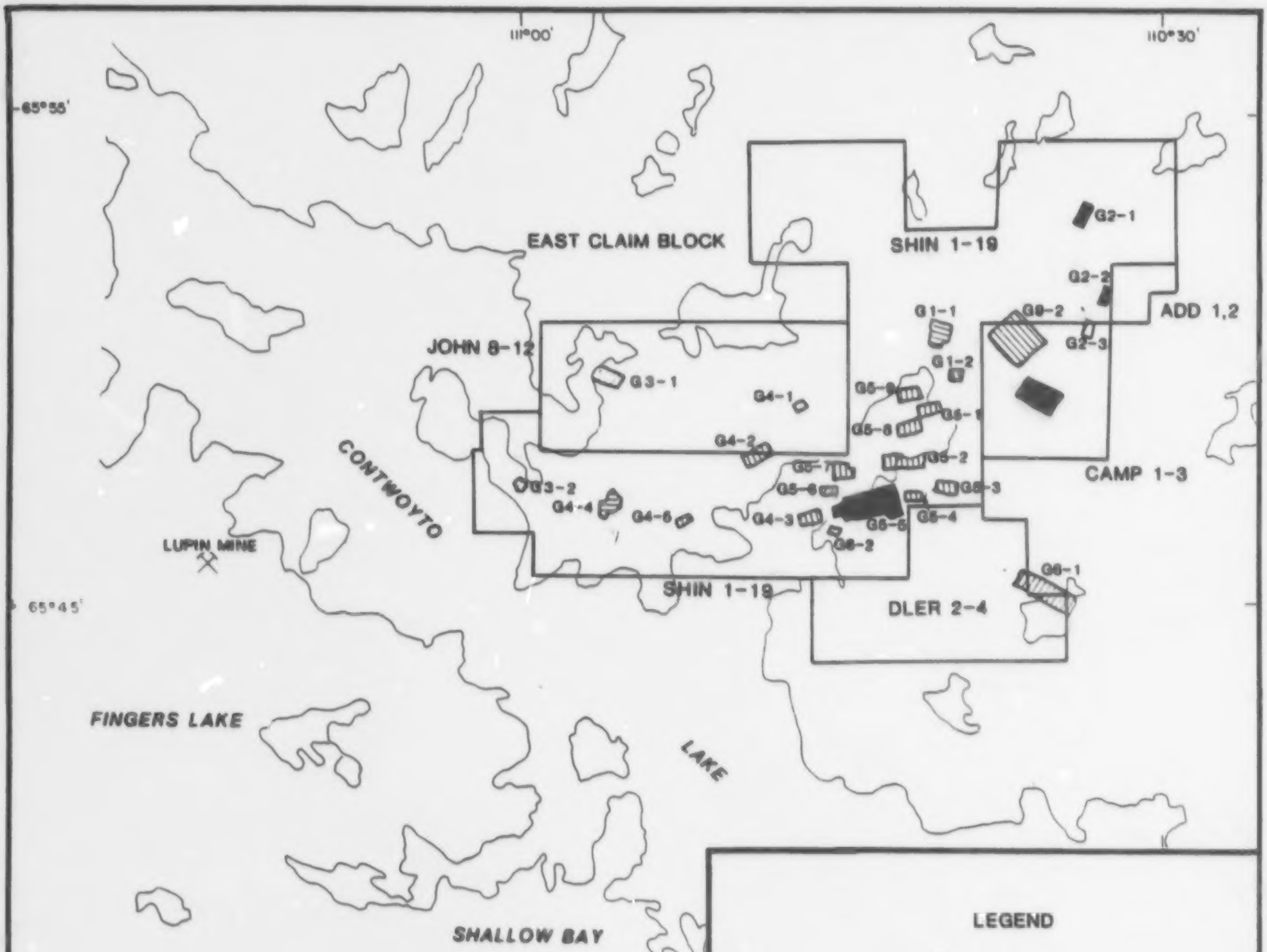
JOHN, SHIN, DLER PROJECT

Hecla Mining Company of Canada Ltd.	Gold
	76 E/10,11,14,15
P.O. Box 49200	65°29'-65°54'N
Bentall Centre Postal Sta.	110°30'-111°08'W
Vancouver, B.C., V7X 1L1	

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton *et al.* (1987); Tremblay (1976).

DIAND assessment reports: 017119, 017120, 017154, 017156, 017162, 017167, 081974, 082131, 082334, 082596.


111°00'
110°30'
65°55'
65°45'
65°35'
EAST CLAIM BLOCK
SHIN 1-19
G2-1
G2-2
G9-2
ADD 1,2
G1-1
G2-3
G1-2
JOHN 8-12
G3-1
G4-1
G5-9
G5-1
G5-8
G4-2
G5-2
CONTWOYTO
G5-7
CAMP 1-3
G3-2
G5-6
G5-3
G4-4
G4-5
G4-3
G5-5
G5-4
LUPIN MINE
G6-2
G6-1
SHIN 1-19
DLER 2-4
FINGERS LAKE
LAKE
SHALLOW BAY
JOHN 2-7
G8-1
G8-2
SOUTHWEST CLAIM GROUP
JOHN 1
G8-3
0
10 km
LEGEND
▥ Grid on which follow-up ground surveys were done in 1986
■ Grid on which 1986 ground surveys were followed by drilling in 1987

Details of surveys conducted on various grids maybe seen in Table 8-5.Note that certain grids were prospected in 1987.

FIGURE 8-30: *JOHN, SHIN, DLER, ADD and CAMP claims and grids.*

PROPERTY

ADD 1, 2; CAMP 1-3; DLER 1-4; JOHN 1-12; SHIN 1-19.

LOCATION

The property (Fig. 8-30) comprised three discrete parts: JOHN 1 and JOHN 2-7 on the southwestern side of Contwoyto Lake; and the remaining claims on the northeastern side forming a large block. An arm of Contwoyto Lake extends northeasterly through the central part of this main block and a base camp has been maintained at the northeastern end of the arm. The base camp is 415 km northeasterly of Yellowknife and 30 km east-northeasterly of Lupin Mine.

HISTORY

The claims cover ground formerly held as Prospecting Permit 33 (76 E/10) and Prospecting Permit 35 (76 E/15) by Canadian Nickel Company Ltd. from 1962 to 1964. An airborne magnetometer survey was followed up by ground magnetometer surveys and geological mapping (DIAND assessment reports: 017119, 017120, 017154, 017156, 017162, 017167). The permits expired in 1964.

The JOHN, SHIN and DLER claims were recorded by B. Weir: SHIN 1-19 in November 1983, JOHN 1-7 in December 1985. They were transferred in March 1984 to Schindler Exploration Consultants Ltd., in June 1985 to 305314 Alberta Ltd. which became Contwoyto Goldfields Ltd., and later in June 1985 to Hecla Mining Company of Canada Ltd. CAMP 1-3 were recorded by J. Schindler in July 1986 and transferred to Hecla in September 1986. ADD 1 and 2, recorded by J. Schindler in September 1987 were not transferred to Hecla until December 1988.

By the end of 1987 the property had decreased slightly in size by the lapse of JOHN 2, SHIN 13, 15, 16 and by reduction in area of JOHN 3, JOHN 9-11, SHIN 11 and DLER 1. Ownership of the northern part of JOHN 6, which adjoins AU 15, AU 23, 24, CTL 1, DIGGER 1, PTC 1, SAM 1, 2 claim block currently under exploration by a Cominco-COGEMA joint venture, is under dispute.

In 1985, helicopter-borne EM (DIGHEM), EM magnetometer and VLF EM surveys were flown over JOHN 1, JOHN 2-7, 8-12, SHIN 1-19, DLER 1-4 (Seaton *et al.*, 1987).

DESCRIPTION

The property area is underlain predominantly by Yellowknife Supergroup metasediments of the Contwoyto Formation. These mainly turbiditic metasediments contain lenses of iron formation, and are intruded by Kenoran granitic plutons and dykes, and by Proterozoic diabase dykes, mostly of the northwesterly trending Mackenzie swarm. The metasediments are of amphibolite facies except in the northeastern part of the property which is underlain by greenschist facies rocks. Fraser (1964), Tremblay (1976) and Bostock (1980), mapped the area (west of longitude 111°W) at 1:506 880, 1:50 000 and 1:250 000 respectively. East of longitude 111°W, 76 E/10 and 76 E/15 were in part geologically mapped by Canadian Nickel Company in the early 1960's (DIAND assessment reports: 017119, 017120).

CURRENT WORK AND RESULTS

In 1986, anomalies delineated by a 1985 airborne geophysical survey were evaluated. Grids were constructed over geophysical anomalies the locations of which are shown in Figure 8-30. Work done on these grids is listed in Table 8-5. Seventy-eight out of 363 conductors detected by airborne EM and VLF EM were tested by ground geological or geophysical surveys, and in the course of this work 327 rock samples were assayed for gold by fire assay - atomic adsorption method. Most assays were low, some below the detection limit of the method. The maximum assay was 2120 ppb Au. On the northeastern side of Contwoyto Lake 56 iron formation zones were mapped. None were mapped on the southwestern side of the Lake where iron formation may be hidden by extensive overburden on the JOHN 1 and JOHN 3-7 claims. Iron formations on four grids (4-4, 4-5, 5-5 and 9-1) have anomalously high gold concentrations.

For the most part, the iron formations trend east-northeasterly to northeasterly, except on CAMP 1, 2 in the eastern part (Grids 9-1 and 9-2) and SHIN 17, 18 in the northeastern part (Grid 2-1) of the property where geophysical results suggest folding.

In 1987 work included prospecting, geophysical surveys and diamond drilling and a petrographic examination of thin sections of 15 rock samples.

A total of 5529 m was drilled in 17 holes: eight on Grid 5-5, five on Grid 2-1, three on Grid 2-2 and one on Grid 9-1. The most encouraging results were obtained from prospecting and drilling on Grid 5-5 where samples from sulphide-rich boulders of amphibolitic iron formation ranged from 3.4 to 28.1 g/t Au. Though weak concentration of gold (2.31 g/t) was intersected over as much as 7.85 m of core, in one hole on Grid 5-5, other holes on this grid intersected much narrower auriferous zones, all under 1 m and mostly under 0.5 m wide. A maximum assay of 25.57 g/t Au across 0.3 m was recorded.

Graphitic beds may be the main cause of some of the airborne EM anomalies, as for example on Grid 2-1. Grids 6-2 and 9-2 were constructed in 1987. Grids 4-5, 5-5, 6-2, 9-1, 9-2 and claim JOHN 12 were prospected in 1987. VLF EM and SP surveys were done on Grids 2-1, 5-5, 6-2, 9-1 and 9-2.

OP Claims

Bow Valley Industries Ltd.	Gold
2020 - 1177 W. Hastings St.	76 E/10,11,14,15
Vancouver, B.C., V6E 2K3	65°44'N, 111°00'W

REFERENCES

Barager and Hornbrook (1963); Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton (1984); Seaton and Crux (1985).

DIAND assessment reports: 017119, 017120, 017167, 017211, 017231, 081474, 081758, 082068.

PROPERTY

OP 1-3.

LOCATION

The claims (Figs. 8-31, 8-32) are at Contwoyto Lake and 395 km northeasterly of Yellowknife. They are 10 km southeasterly of Lupin Mine.

HISTORY

Most of the area covered by the OP 1-3 claims was staked as part of the BOX claim block by Conwest Exploration Company Ltd. in 1961. Falconbridge Nickel Mines Ltd. optioned the BOX claims and explored them between 1961 and 1963 (DIAND assessment reports: 017211, 017231). Work included geological mapping, magnetometer surveys, trenching and diamond drilling of 3 holes.

TABLE 8-5: EXPLORATION ON JOHN, SHIN, DLER PROJECT IN 1986 (Modified from DIAND Assessment Report 082596).

GRID	GRIDDING BASE LINE LINES (l-km)	TOTAL FIELD & VERTICAL GRADIENT MAGNETICS (l-km)	VLF-EM TRANSMITTER (l-km)	HLEM C.S.=50 m (l-km)	HLEM C.S.=100 m (l-km)	HLEM C.S.=150 m (l-km)	SP (l-km)	GEOLOGICAL MAPPING
G1-1	1.100, 13.200	14.300	NLK, 11.300	–	13.025	3.175	5.375	In part-west side of grid only.
G1-2	0.100, 1.050	–	NLK, (1.050)	–	–	–	–	Not done-no bedrock exposed.
G2-1	1.100, 13.600	15.425	NLK, 12.287	–	13.250	–	10.250	Completed-outcrop rare.
G2-2	1.400, 10.425	11.625	NAA, 10.550	–	9.925	–	2.800	Completed-boulder fields and frost heave only.
G2-3	0.500, 2.625	3.137	NLK, 2.562	–	–	–	1.050	Completed-frost heave only.
G3-1	1.200, 7.525	8.637	NAA, 7.525	–	7.350	4.075	3.175	Not done.
G3-2	1.800, 3.700	5.500	NAA, 3.775	–	4.950	–	1.750	Completed.
G4-1	0.300, 3.000	3.300	NAA, 3.000	–	3.000	–	2.300	Completed.
G4-2	1.200, 6.300	7.450	NLK, 6.500	–	6.275	–	–	Completed.
G4-3	1.200, 7.800	3.550	NAA, 7.875	–	.525	5.625	–	Not done-grid on lake ice.
G4-4	0.950, 6.75	6.537	NAA, 7.700	–	–	5.487	1.625	Completed.
G4-5	0.500, 3.000	3.500	NLK, 3.150	–	3.000	–	–	Completed.
G5-1	1.000, 5.500	6.525	NAA, 5.500	–	5.525	–	2.200	Completed-much of grid on lake ice.
G5-2	1.900, 10.750	12.475	NAA, 10.750	–	10.800	2.700	4.950	Completed.
G5-3	0.700, 4.000	4.700	NAA, 4.000	–	4.000	–	1.250	Completed.
G5-4	1.000, 6.500	7.224	NAA, 6.350	–	5.750	2.925	7.000	Completed.
G5-5	2.700, 29.300	31.388	NAA, 29.275	1.225	29.450	0.475	18.675	Completed.
G5-6	0.500, 3.000	3.500	NAA, 3.000	–	–	4.300	–	Not done-grid on lake ice.
G5-7	1.000, 8.200	9.200	NAA, 8.200	–	4.050	9.100	–	Not done-grid on lake ice.
G5-8	0.500, 3.000	3.500	NAA, 3.000	–	0.500	3.575	–	Not done-grid on lake ice.
G5-9	0.900, 5.800	7.000	NAA, 5.800	–	6.475	0.750	–	Not done-grid on lake ice.
G6-1	1.900, 12.000	14.550	NAA, 11.675	–	10.950	3.600	1.850	Completed.
G8-1	0.900, 4.400	5.275	NSS, 4.500	–	4.400	–	–	Completed-boulder fields and frost heave only.
G8-2	0.500, 1.850	2.862	NSS, 2.350	–	2.225	–	–	Completed-no outcrop, one boulder field.
G8-3	1.000, 8.775	9.776	NLK, 8.775	–	9.550 4.675	–	–	Completed.
G9-1	1.000, 13.250	14.587	NAA, 13.250	–	12.650	–	10.275	Completed.
TOTAL:	27.650 145.500	215.725	192.650	1.225	172.300	45.787	74.525	

GRAND TOTAL of HLEM: 219.312

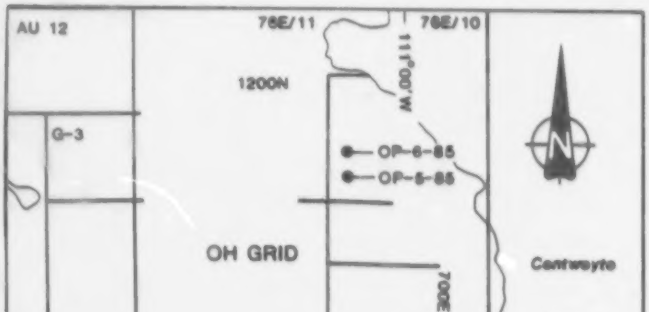


FIGURE 8-31: OP claims, grids and 1985 drill holes.

The eastern margin of the OP claim group was held from 1962 to 1965 as Prospecting Permit 33, which covered 76 E/10. Exploration of Prospecting Permit 33 is recorded in DIAND assessment reports 017119, 017120 and 017167. Work in the OP property area is also summarised in Baragar and Hornbrook (1963), Seaton (1984) and Seaton and Crux (1987).

From 1965 to 1980 work was not reported for the area covered by OP 1-3. In January 1980, M. Magrum recorded the IGOR 1 claim for Oxen Engineering Ltd. The claim name was changed to OP 1 and the claim transferred to OP Resources Ltd. who in July 1983 recorded OP 2 and 3.

A geochemical survey of the IGOR claim is recorded in DIAND assessment report 081474. Report 081758 details geological mapping, geophysical surveys, trenching and drilling by OP Resources in 1983.

In 1985 Bow Valley Industries by agreement with OP Resources Ltd. explored the claims by ground follow-up of an airborne EM (Input) and magnetometer survey. This work is reported in DIAND assessment report 082068.

OH Grid, consisting of 20.5 km of line, was constructed over an Input conductor coincident with the Main and the Valley iron formation zones. The grid was geologically mapped and explored by geological mapping magnetometer, vertical magnetic gradient, and HLEM surveys. The northernmost 3.7 km of grid was surveyed by VLF EM. Fifty-one grab samples were assayed for gold.

Two diamond drill holes totalling 175 m drilled on the Main Zone, intersected encouraging gold concentrations over maximum width of 1.04 m.

DESCRIPTION

The property is mainly underlain by Archean metagreywacke of the Contwoyto Formation, which contains iron formation lenses that are locally auriferous. The regional geology west of longitude 111°W has been mapped by Tremblay (1976) at 1:50 000. Tremblay's mapping is incorporated in the 1:250 000 map in Bostock (1980). East of 111°W the only published map of the area is that of Fraser (1964) at 1:506 880 scale. Mapping at a larger scale by Falconbridge Nickel Mines covering much of 76 E/10 is recorded in DIAND assessment reports 017119 and 017120.

Metasediments strike northerly through the OP claims and are cut by diabase dykes of the Helikian Mackenzie Swarm.

Progress of mapping by the Geological Survey of Canada in the Contwoyto Lake area is given in King *et al.* (1988).

CURRENT WORK AND RESULTS

In 1986 Bow Valley Industries did HLEM surveying and drilled one hole on the OH Grid.

GOLD AND JON AIRBORNE SURVEYS

Cominco Ltd.
Suite 700, 409 Granville St.
Vancouver, B.C., V6C 1T2

Gold
76 E/10,14,15

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).
DIAND assessment reports: 017120, 017167, 082516.

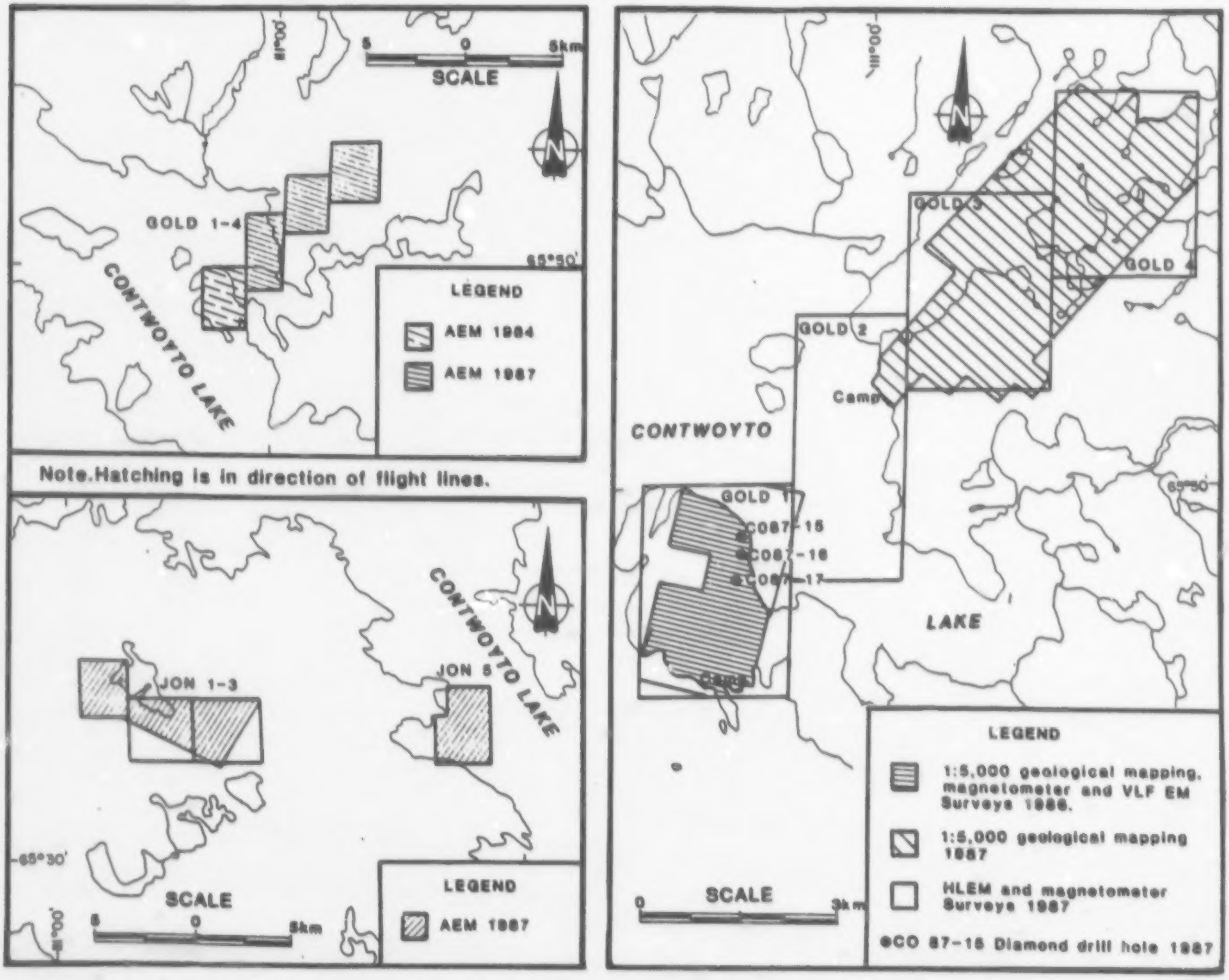
PROPERTY

GOLD 2-4; JON 1-3; JON 5-8.

LOCATION

Three blocks of claims are from 385 km to 415 km northeasterly of Yellowknife (Fig. 8-32):

Area	Claim	Lat.	Long.
1	JON 1-3,7,8	65°34'N	110°53'W
2	JON 5,6	65°34'N	110°36'W
3	GOLD 2-4	65°52'N	110°58'W



111°00'
5
0
5km
SCALE
N
GOLD 1-4
65°50'
CONTWOYTO LAKE
LEGEND
AEM 1984
AEM 1987
Note.Hatching is in direction of flight lines.
N
CONTWOYTO LAKE
JON 1-3
JON 5
65°30'
111°00'
SCALE
5
0
5km
LEGEND
AEM 1987
111°00'
N
GOLD 3
GOLD 4
GOLD 2
Camp
CONTWOYTO
65°50'
GOLD 1
CO87-15
CO87-16
CO87-17
LAKE
Camp
0
SCALE
3km
LEGEND
1:5,000 geological mapping, magnetometer and VLF EM Surveys 1986.
1:5,000 geological mapping 1987
HLEM and magnetometer Surveys 1987
●CO 87-15 Diamond drill hole 1987

FIGURE 8-32: GOLD and JON claims. Airborne geophysical survey coverage and grids.

Areas 1 and 2 are west or on the west shore of Contwoyto Lake and area 3 is on the east side.

HISTORY

JON 1, 2 were recorded in August and JON 3 in December of 1985, GOLD 2-4 in April 1986, JON 5, 6 in September 1986 and JON 7, 8 in July 1987.

Prospecting Permit 33, covering 76 E/10, was mapped in 1963 and 1964 by Canadian Nickel Company Ltd. (assessment reports 017120, 017167).

DESCRIPTION

The only published map of 76 E/10 is in Fraser (1964) at a reconnaissance scale of 1:506 880. The adjoining area to the west is covered by more detailed maps by Bostock (1980) at 1:250 000 and Tremblay (1976) at 1:50 000. The area is mainly underlain by metaturbidites of the Contwoyto Formation of the Archean Yellowknife Supergroup in which the pelitic component has been metamorphosed to cordierite-, andalusite- or staurolite-bearing knotted schists. The Contwoyto Formation contains units of iron formation. Abundant Helikian diabase dykes cut the Archean rocks. Most of Survey area 2 is water covered.

CURRENT WORK AND RESULTS

Helicopter-borne electromagnetic / resistivity / magnetic / VLF EM (DIGHEM) surveys of the three blocks of claims (DIAND assessment report 082516) outlined numerous bedrock conductors and anomalies of possible bedrock origin. Many conductors were coincident with, or flanked by, magnetic anomalies. The presumed target of this work was auriferous iron formations in the Contwoyto Formation.

Diabase dykes give rise to abundant strong northwesterly trending magnetic features.

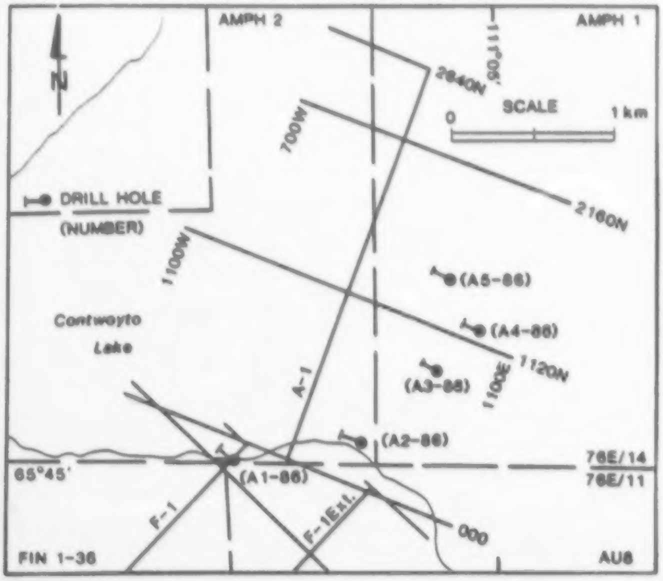

AMPH 2
AMPH 1
N
111°05'
2640N
SCALE
0
1 km
700W
DRILL HOLE
(NUMBER)
2160N
1100W
(A5-86)
Contwoyto
Lake
(A4-86)
1120N
(A3-86)
1100E
A-1
(A2-86)
76E/14
65°45'
76E/11
(A1-86)
F-1
F-1Ext.
000
FIN 1-36
AU8

FIGURE 8-33: AMPH 1,2 claims, grids and drill holes.

AMPH CLAIMS

Bow Valley Industries Ltd. Gold
2020 - 1177 W. Hastings St. 76 E/11
Vancouver, B.C., V6E 2K3 65°46'N, 111°06'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976).

DIAND assessment report: 082097.

PROPERTY

AMPH 1, 2.

LOCATION

The claims cover part of Contwoyto Lake (Figs. 8-33, 8-34) and are 390 km northeasterly of Yellowknife. They are centred 6 km east of Lupin Mine.

HISTORY

AMPH 1, 2 recorded in July 1983 were acquired by option by Bow Valley from M. Magrum. Bow Valley explored the southwestern part of the claims by an airborne Input EM and magnetometer survey in 1985.

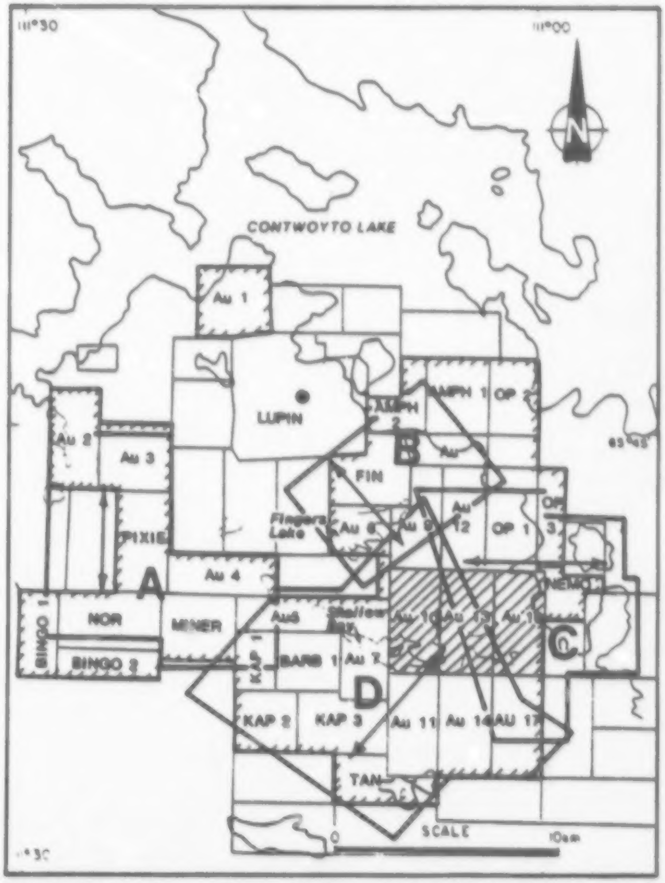

111°30
111°00
N
CONTWOYTO LAKE
Au 1
LUPIN
AMPH 1
OP 2
AMPH 2
Au 2
Au 3
B
Au
65°45
FIN
Au 12
OP 3
Fingers Lake
Au 6
Au 9
OP 1
PIXIE
A
Au 4
NEMO
BINGO 1
NOR
MINER
Au5
Shallow Bay
Au 10
Au 13
Au 16
C
KAP 1
BARB 1
Au 7
BINGO 2
D
KAP 2
KAP 3
Au 11
Au 14
AU 17
TAN
0
SCALE
10km
111°30

FIGURE 8-34: Bow Valley Industries' claims and optioned property in Contwoyto Lake area, with DIGHEM coverage (from DIAND assessment report 082064).

DESCRIPTION

From the geology of the adjoining southwestern shore of Contwoyto Lake it seems likely that bedrock beneath the Lake would be metasediments of the Contwoyto Formation. The geology of the surrounding area has been mapped at progressively more detailed scales by Fraser (1964), Bostock (1980) and Tremblay (1976). King *et al.* (1988) summarises progress on current mapping.

CURRENT WORK AND RESULTS

A grid (A-1 Grid) was constructed on AMPH 1 and 2 claims (Fig. 8-33) on the ice of Contwoyto Lake and a grid (F-1 Grid) on the adjoining FIN claims was extended north from the shoreline onto the Lake on AMPH 2. HLEM, VLF EM and total field magnetometer surveys were performed on the A-1 Grid, and VLF EM, total field magnetometer and vertical magnetic gradient surveys on the F-1 extension grid. Geophysical targets delineated by these surveys were tested by five diamond drill holes. All holes cut iron formation, some with a high sulphide but low gold content.

The iron formations are enclosed by greenschist-grade turbiditic metasediments which comprise greywacke, siltstone and argillite, and are locally, as in drill hole 4, graphitic. The metasediments, which are on the eastern limb of a syncline mapped by Tremblay (1976) show numerous reversals of stratigraphic tops in the drill core.

AU 10, 13, 16, 27

Bow Valley Industries Ltd.	Gold
2020 - 1177 W. Hastings St.	76 E/11
Vancouver, B.C., V6E 2K3	65°41'N, 111°00'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton and Crux (1985); Seaton *et al.* (1987); Tremblay (1976).

DIAND assessment reports: 017167, 081739, 081859, 082064.

PROPERTY

AU 10, 13, 16, 27; NEMO.

LOCATION

The claims are roughly 395 km northeasterly of Yellowknife. They cover most of Shallow Bay of Contwoyto Lake and extend northwesterly to Fingers Lake.

HISTORY

The exploration history of the area is outlined in the several assessment reports cited and summarised in Seaton and Crux (1985) in which additional references are given.

AU 10, 13, 16 and 27 were recorded for Hemisphere Development Corporation in February 1981 and optioned by Bow Valley Industries which explored them as summarised in Seaton and Crux (1985) and Seaton *et al.* (1987).

The NEMO claim was recorded in October 1984 for Bow Valley Industries Ltd.

DESCRIPTION

Greenschist facies metasediments of the Contwoyto Formation, interlayered with three belts of intermediate tuff, underlie much of the claims. There are numerous thin units of iron formation in the metagreywackes and meta-argillites of the Contwoyto Formation. Sediments and tuffs strike west-northwesterly and are cut by several diabase dykes of the Mackenzie Swarm.

Much of the central part of the property is overburden-covered and the NEMO claim is largely covered by the waters of Contwoyto Lake.

CURRENT WORK AND RESULTS

Work, previously unreported, done in 1985 included an airborne Input EM and magnetometer survey, which covered the property as part of a larger area, 128 line-km of grid construction, geological mapping, geophysical surveys and diamond drilling of one 68 m hole. Grids and the drill hole are shown in Figure 8-35.

Grid H4 was explored by geological mapping, Grid H5 by geological mapping, total field magnetometer, vertical magnetic gradient and VLF EM surveys. Grid H7 was geologically mapped. Grid H0 was geologically mapped and explored by total field magnetometer, vertical magnetic gradient and horizontal loop EM surveys. Grid V4 was in part geologically mapped and explored by total field magnetometer, vertical magnetic gradient and VLF EM surveys.

Core from diamond hole H5-85, drilled on the H0 Grid is locally graphitic and pyritic but did not contain gold. Grab samples of iron formation were not auriferous.

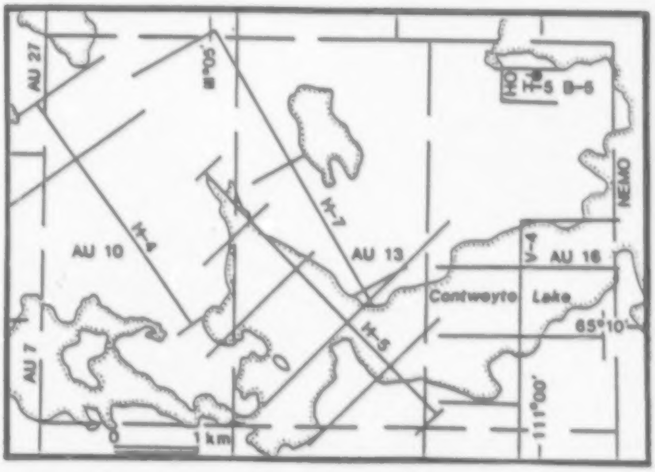


FIGURE 8-35: AU 10, 13, 16 claims and grids.

BINGO CLAIM

Bow Valley Industries Ltd.	Gold
2020 - 1177 W. Hastings St.	76 E/11
Vancouver, B.C., V6E 2K3	65°39'30"N, 111°24'W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).

DIAND assessment report: 082542.

PROPERTY

BINGO 2.

LOCATION

The BINGO 2 claim (Fig. 8-36) is 285 km northeasterly of Yellowknife and 12 km southwesterly of Fingers Lake, which is connected by 7 km of gravel road to Lupin Mine.

HISTORY

BINGO 1 and 2 claims were recorded in September 1985, to cover several anomalies outlined by a Questor Mark VI input and magnetometer survey.

DESCRIPTION

The area was first geologically mapped in 1963 as part of a 1:506 880 reconnaissance (Fraser, 1964). The Lupin Mine area (76 E/11,14) was mapped at 1:50 000 by Fraser (1964). This area is included in the northeastern corner of the Itchen Lake area map by Bostock (1980).

Tremblay (1976) shows the BINGO 2 claim area to be largely underlain by leucocratic mainly fine-grained quartz-feldspar-biotite gneiss, in part massive coarse-grained red granite, and along its northern boundary, quartzitic fine-grained quartz-feldspar-biotite gneiss. A gabbroic dyke of the Mackenzie Swarm trends northwesterly through the northeastern corner of the claim. There is less than 5% outcrop on BINGO 2.

CURRENT WORK AND RESULTS

Between the 1985 airborne survey and 1987, a small grid was established in the northeastern corner of BINGO 1 and explored by reconnaissance magnetometer and VLF EM surveys. In 1987, 11.9 line-km of grid were constructed over the northeastern corner of BINGO 1 claim to cover several AEM anomalies. The grid was explored by total field, magnetic gradient and horizontal loop EM surveys. Four easterly trending conductors were outlined and one in the central part of the grid was tested by an 81 m diamond drill hole.

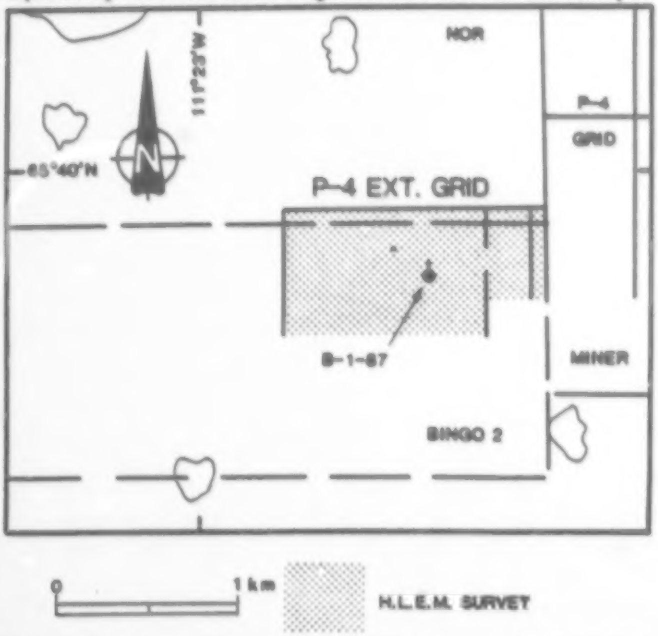


FIGURE 8-36: BINGO 2 claim, grid and geophysical coverage.

Drilling intersected metaturbidites (greywacke and cordierite-biotite schists), which are locally graphitic or pyritic.

One EM conductor is attributed to a graphitic cordierite-biotite schist observed both in drill core and outcrop. Graphite may be the cause of the other three conductors. A strong northwesterly trending magnetic feature in the eastern part of the grid is caused by a diabase dyke coincident with a gabbroic or basaltic dyke mapped by Tremblay (1976).

COM CLAIMS

Aurun Mines Ltd.	Gold
P.O. Box 602	76 E/11
Aldergrove, B.C., VOX 1A0	63°36'N, 111°13'W

REFERENCES

Bostock (1980); Fraser (1964); Seaton and Crux (1985); Tremblay (1976).

DIAND assessment reports: 017132, 080690, 082149, 082554.

PROPERTY

COM 1, 2.

LOCATION

The property is 385 km northeasterly of Yellowknife and roughly 19 km south of Lupin Mine (Fig. 8-37).

HISTORY

Gold discoveries in the northern Contwoyto Lake area in 1960 by the Canadian Nickel Company Ltd. resulted in a staking rush in 1961. Work done in the 1960's on ground now staked as COM 1 and an adjoining area to the north and northeast is summarised in Seaton and Crux, 1985, where reference is made to some of the numerous assessement reports detailing work at that time. COM 1, occupies ground held by Roberts Mining company as part of the ROB Group in 1963. The ROB Group was explored by a geological reconnaissance in I963 (DIAND assessment report 017132). Much of the ROB Group was restaked as KAP 2 and 3 in 1983 during a staking rush that followed the 1982 start-up of Lupin Mine.

COM 1, 2 were recorded in November 1983 by B. Weir of Yellowknife. In September 1984 B. Weir optioned the claims to Aurun Mines. Work in 1987 was funded by Equinox Resources Ltd.

DESCRIPTION

Maps covering the area at progressively more detailed scales include: Fraser, 1964 (1:506 880), Bostock, 1980 (1:125 000) and Tremblay, 1976 (1:50 000). The northeastern

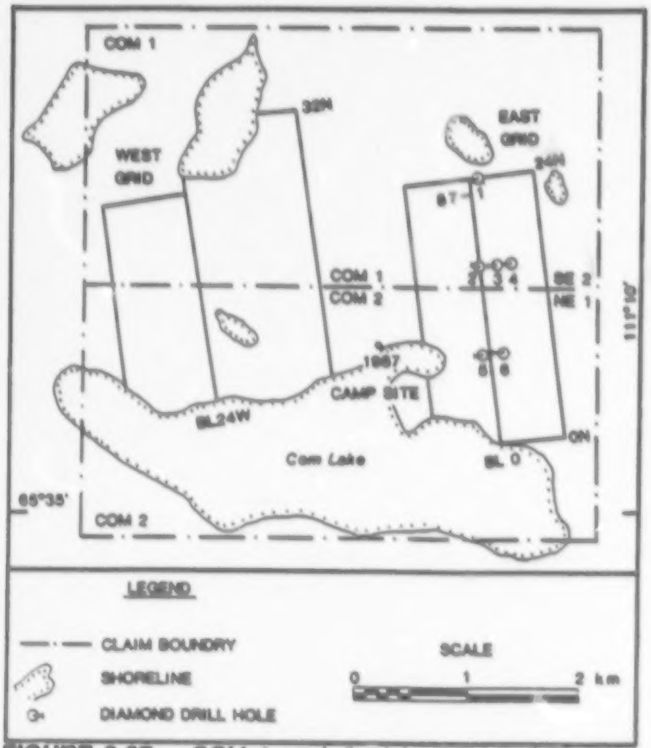


FIGURE 8-37: COM 1 and 2 claims, grids and 1987 diamond drill holes.

part of Bostock's map is adapted from earlier geological mapping by Tremblay. King and others 1988, show the COM 1, 2 area to be underlain by northerly striking intermediate volcaniclastics of the Central volcanic belt and sillimanite-grade metasediments of the Itchen Formation. The volcaniclastics flank the eastern margin of the Olga Tonalite. Tremblay (1976) in Map 1411A has mapped King's Olga Tonalite as various subdivisions of his Unit 1 (leucocratic medium- to fine-grained quartz-feldspar biotite gneiss, in part massive coarse-grained red granite) and the volcaniclastics as layered and massive quartz-feldspar biotite gneiss grading easterly into metasediments.

CURRENT WORK AND RESULTS

Work in 1986 was designed to evaluate EM (Input) conductors and magnetic anomalies discovered during a survey flown over the Central volcanic belt in 1977 at a time when volcanogenic massive sulphide deposits were the primary exploration target (DIAND assessment report 080690). The East and West grids cover separate clusters of Input anomalies.

Exploration in 1986 (DIAND assessment report 082149) comprised geological mapping and prospecting mainly on the East Grid, and geophysical surveys on both East and West grids. Total field and vertical magnetic gradient surveys, VLF EM and self-potential were conducted on both east and west grids; a horizontal loop EM survey was done on the East Grid only. Conductors and flanking, less commonly coincident, magnetic anomalies and self potential anomalies were delineated. As a result of this work, ten diamond drill holes were proposed: seven on the East Grid and three on the West Grid.

In 1987 (DIAND assessment report 082554) a horizontal loop EM survey was performed on the West Grid and six diamond drill holes, ranging in depth from 49 m to 80 m and totalling 397 m, were drilled on the East Grid. Results were disappointing with all core assays less than 0.25 g/t Au, and most under 0.03 g/t Au. EM and SP anomalies outlined in 1986 are evidently caused by graphitic schists and zones which contain pyrite, quartz and lesser amounts of pyrrhotite. Northerly to northwesterly trending diabase dykes are the main cause of the magnetic anomalies. One dyke trends northerly close to the base line of the East Grid.

Cordierite, staurolite, andalusite and garnet were reported from drill core, but not sillimanite. The most common rock intersected in drilling was quartz-feldspar biotite schist.

MINER and NOR Claims

Bow Valley Industries Ltd.	Gold
2020 - 1177 W. Hastings St.	76 E/11
Vancouver, B.C., V6E 2K3	65°40'N, 111°19'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton and Crux (1985); Seaton *et al.* (1987); Tremblay (1976).

DIAND assessment reports: 017106, 017200, 017203, 017205, 082071.

PROPERTY

MINER; NOR.

LOCATION

The claims are 390 km northeasterly of Yellowknife, 10 km west of Shallow Bay, Contwoyto Lake and 11 km south-southwesterly of Lupin Mine.

HISTORY

The MINER claim was recorded in March 1983 and acquired by Bow Valley Industries in April 1984. The NOR claim was recorded for Bow Valley Industries in October 1984. The history of exploration, which dates back to 1961, is summarised in greater detail in Seaton and Crux (1985) and Seaton *et al.* (1987), who give additional references, and is recorded in the assessment reports cited.

Geological mapping, geophysical surveys and diamond drilling were done on a claim block comprising the AU 4, 5, 7, 11 KAP 1-3, MINER and BARB 1 claims but details of this work are not available.

DESCRIPTION

The MINER and NOR claims (Fig. 8-38) are underlain by Contwoyto Formation metasediments which flank the northern margin of the Wishbone Granodiorite (King *et al.*, 1988). Tremblay (1976) mapped the rocks of this pluton as coarse- and fine-grained red granite. The metasedimentary rocks underlying the claims comprise: quartz-feldspar-biotite gneiss; nodular quartz-biotite schist and gneiss (cordierite-bearing or locally with andalusite or garnet); quartz-biotite schist; and minor iron formation consisting of amphibole and quartz ± chlorite, ± garnet ± biotite ± pyrite ± pyrrhotite ± arsenopyrite. The iron formation is compositionally layered and includes garnetiferous layers, 1-30 cm across.

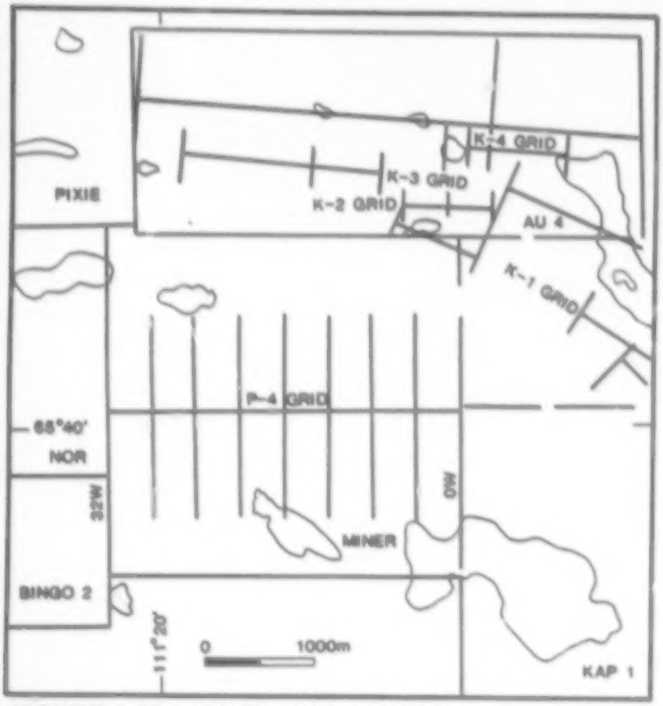

PIXIE
K-4 GRID
K-3 GRID
K-2 GRID
AU 4
K-1 GRID
P-4 GRID
65°40'
NOR
32W
0W
MINER
BINGO 2
111°20'
0
1000m
KAP 1

FIGURE 8-38: MINER claim and grid.

The metasediments strike west-northwesterly and are cut by north-northwesterly trending Helikian diabase dykes of the Mackenzie Swarm.

CURRENT WORK AND RESULTS

The P-4 grid of roughly 80 line-km was constructed with an east-trending baseline. The grid covers all of the MINER claim except for its northern and southern marginal areas. Geological mapping, VLF EM, magnetometer and HLEM surveys were completed over the whole grid. Forty-six grab samples, many from iron formation, were assayed for gold. Three samples of iron formation assayed at over 1 ppm Au.

Though several of the VLF EM and HLEM conductors are coincident with iron formation and locally with isolated magnetic highs, a long conductive zone delineated by VLF EM and both 444 Hz and 3555 Hz HLEM, but with no magnetic correlation, is probably related to graphitic beds underlying till.

PIXIE CLAIM

Bow Valley Industries Ltd.	Gold
2020 - 1177 W. Hastings St.	76 E/11
Vancouver, B.C., V6E 2K3	65°42'30"N, 111°21'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Seaton *et al.* (1987); Tremblay (1976).

DIAND assessment reports: 017161, 017200, 017203, 017205, 017210, 060330, 082047, 082102.

PROPERTY

PIXIE.

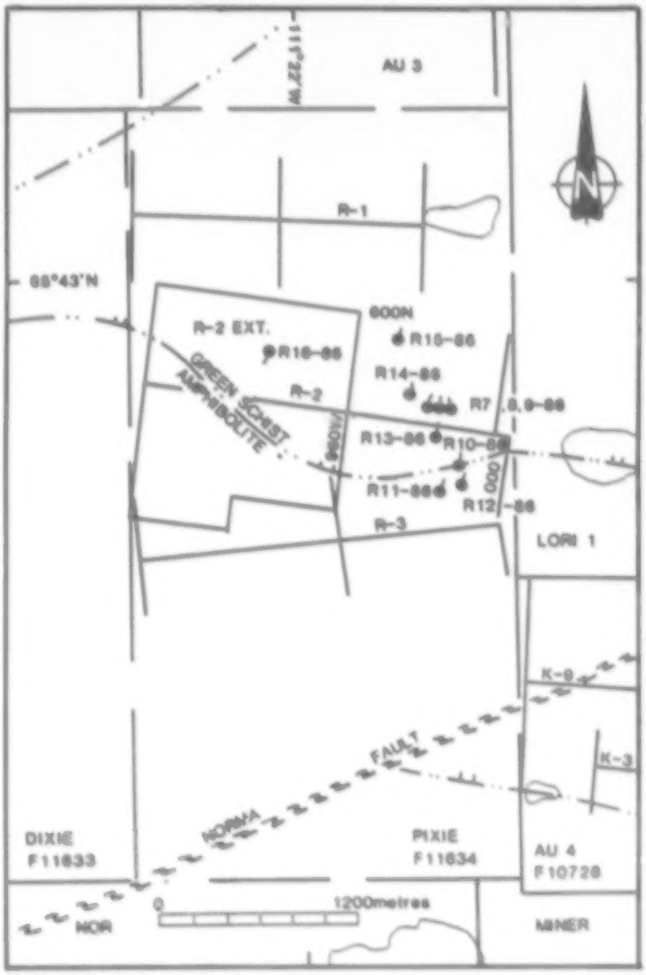

111°22'W
AU 3
R-1
65°43'N
000N
R-2 EXT.
R16-86
R15-86
R14-86
GREEN SCHIST
AMPHIBOLITE
R-2
R7,8,9-86
R13-86
R10-86
1900W
000
R11-86
R12-86
R-3
LORI 1
K-9
K-3
FAULT
NORMA
DIXIE
F11633
PIXIE
F11634
AU 4
F10728
0
1200metres
NOR
MINER

FIGURE 8-39: PIXIE claim, grids and diamond drill holes. Geology from DIAND assessment report 082102.

LOCATION

The claim is 390 km northeasterly of Yellowknife and 10 km southwesterly of Lupin Mine (Fig. 8-39).

HISTORY

The area was explored in the early 1960's as summarised in Seaton *et al.* (1987) and described in DIAND assessment reports 017161, 017200, 017203, 017205 and 017210.

PIXIE was recorded by P. McKay in March 1983 and transferred to Rockridge Mining Corporation in 1984. Bow Valley optioned the claim in 1986, flew an Input EM survey and tested three anomalies detected by the airborne survey by geological mapping, sampling, ground geophysics and diamond drilling (Seaton *et al.*, 1987; DIAND assessment report 082047).

DESCRIPTION

The claim is underlain by metasediments of the Contwoyto Formation which include metaturbidites of greenschist and amphibolite facies. The Norma Fault that trends northeasterly through the southern part of the claim truncates the greenschist-amphibolite boundary (Seaton *et al.*, 1987).

CURRENT WORK AND RESULTS

In 1986 exploration was focused on the R-2 grid in the central part of the PIXIE claim. The grid was extended westward.

VLF EM, HLEM, total field magnetometer and vertical magnetic gradient surveys were performed on the extended R-2 grid.

Ten holes totalling 940 m were drilled on the eastern part of the R-2 grid. Conductive trends correlative with magnetic features proved to be silicate or sulphide iron formation. However only one 0.5 m intersection had encouraging gold content of 3 g/t.

CAR CLAIMS

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	76 E/12; 86 H/9
200 Granville St.	65°39'-65°45'N
Vancouver, B.C., V6C 1S4	111°32'-112°05'W

REFERENCES

Bostock (1980); King *et al.* (1988); Seaton *et al.* (1987).

DIAND assessment reports: 082502, 082503, 082504, 082580.

PROPERTY

CAR 1-15.

LOCATION

The claims are 375 to 390 km northeasterly of Yellowknife and extend roughly 20 km west of Concession Lake (Fig. 8-40). CAR 1-3 are on 86 H/9. The remaining twelve CAR claims are on 76 E/12. Car 10 and 11 form a discrete group about 2 km north of the main block of CAR claims.

HISTORY

The property covers part of the area explored by Canadian Nickel Company Ltd. from 1982 to 1984 as Prospecting Permit 34, which covered 76 E/12 (Seaton *et al.*, 1987).

The property area was explored by Echo Bay Mines by airborne geophysics (DIGHEM) in July 1985, which covered an area extending from Itchen Lake to Contwoyto Lake. Numerous geophysical anomalies were outlined and a selection of these were investigated on the ground by prospecting, geological mapping and in some cases VLF EM and magnetometer surveys.

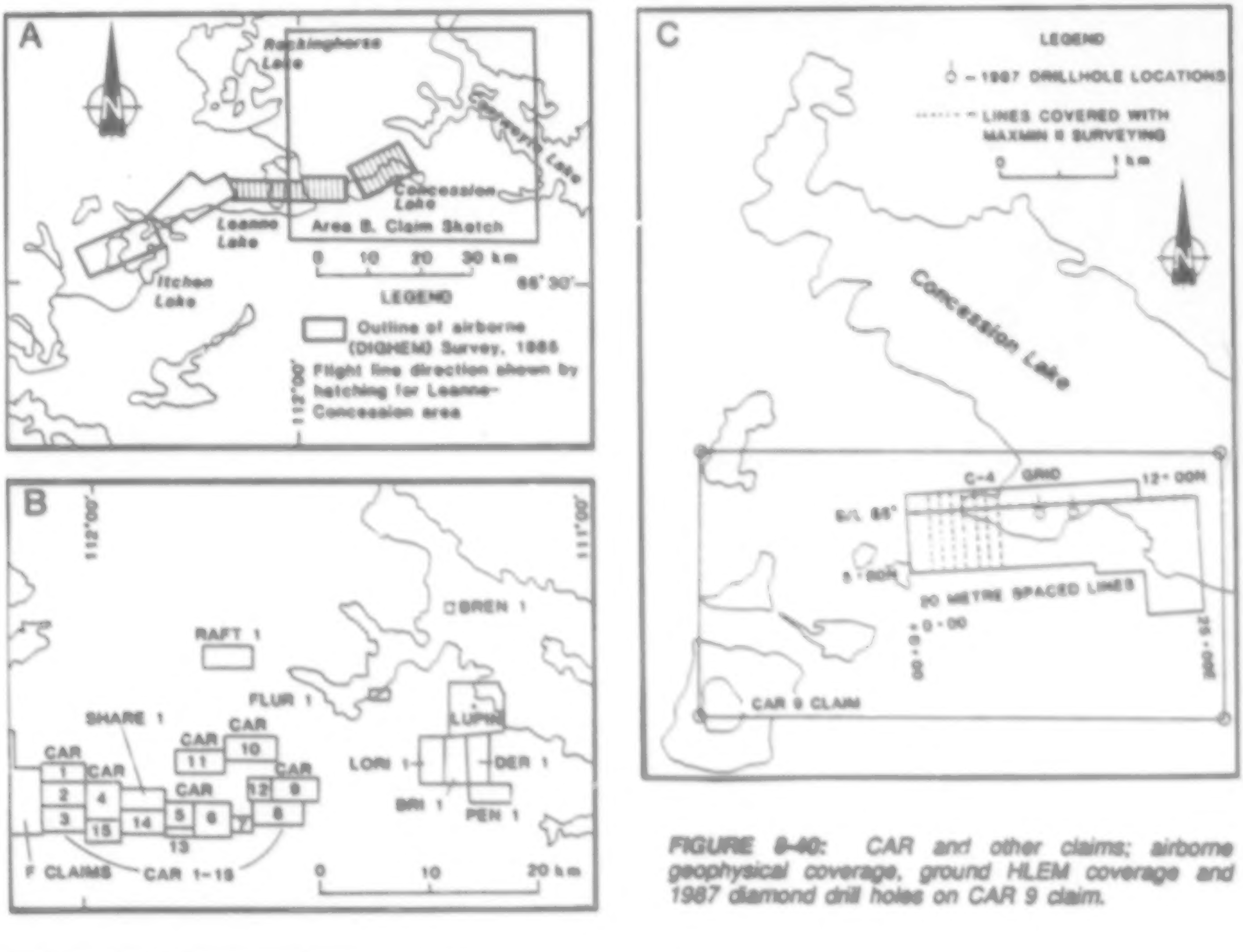

A
Rockinghorse Lake
Contwoyto Lake
Concession Lake
Leanne Lake
Itchen Lake
Area B. Claim Sketch
0 10 20 30 km
65° 30'
112°00'
LEGEND
Outline of airborne (DIGHEM) Survey, 1985
Flight line direction shown by hatching for Leanne-Concession area
B
112°00'
111°00'
BREN 1
RAFT 1
FLUR 1
LUPIN
SHARE 1
CAR
CAR 10
CAR 11
CAR 1
CAR 2
CAR 3
CAR 4
CAR 15
CAR 14
CAR 13
CAR 5
CAR 6
CAR 7
CAR 8
CAR 9
CAR 12
LORI 1
DER 1
BRI 1
PEN 1
F CLAIMS
CAR 1-15
0 10 20 km
C
LEGEND
1987 DRILLHOLE LOCATIONS
LINES COVERED WITH MAXMIN II SURVEYING
0 1 km
Concession Lake
C-4 GRID
12+00N
B/L 85°
5+00N
20 METRE SPACED LINES
0+00
0+00
25+00E
CAR 9 CLAIM

FIGURE 8-40: CAR and other claims; airborne geophysical coverage, ground HLEM coverage and 1987 diamond drill holes on CAR 9 claim.

As a result of this work additional claims were staked including CAR 13-15.

CAR 1-12 were recorded for Echo Bay Mines in July 1985 and CAR 13-15 in November 1985.

Three gold showings were discovered in 1985: one in the southwestern part of the CAR 6 claim, one in the southeastern part of CAR 9 and one in the northwest corner of CAR 7.

DESCRIPTION

The claims cover part of an arcuate belt of metasediments of the Contwoyto Formation, which by definition (Bostock, 1980) contains iron formation lenses. The belt extends from Point Lake, through Itchen Lake to Contwoyto Lake (Fig. 8-40). The iron formation is locally sulphide-bearing and auriferous.

Progress in remapping of the eastern (Contwoyto Lake) part of the area through which the Contwoyto Formation extends is reported in King *et al.* (1988).

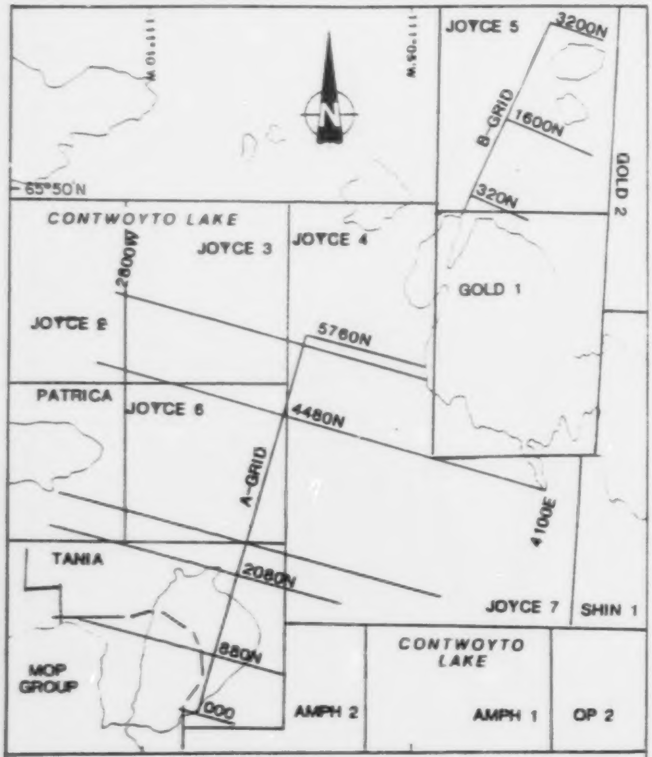
CURRENT WORK AND RESULTS

After compilation of airborne geophysical and ground survey data, numerous targets were selected for investigation in 1986, but of these less than half were examined. The targets selected were auriferous or potentially auriferous iron formation either exposed at surface or indicated by geophysical anomalies. On each of claims CAR 2, 3, 4, 7, 8 and 14 one target was prospected and mapped at 1:15 000. On the CAR 9 claim two gold showings were prospected and mapped at 1:1000. At one of these, the C-4 showing, 0.22 km of additional grid was constructed and 1.5 line-km of magnetometer surveying done. Of 51 samples collected during prospecting, 15 were from CAR 6 claim and 21 from CAR 9, 18 of which were taken from the C-4 gold showing. This showing is a zone of folded but generally easterly striking auriferous iron formation that outcrops near the southwestern shore of Concession Lake.

In 1987 additional grid was constructed on CAR 14 claim at the LE-2 target area which was geologically mapped at 1:15 000 in 1986. Grid construction was followed by prospecting, 1:2000 mapping and a magnetometer survey.

On CAR 5, 6, 13 and 14 claims, targets prospected in 1985 were geologically mapped at 1:15 000 and explored by additional prospecting. In the northeastern corner of CAR 15 the "Canico 26 Grid" was explored by 1:15 000 geological mapping and prospecting. Further work was recommended only at the LE-2 and LE-4 targets on CAR 14.

Much of the 1987 work was focused on the CAR 9 claim at the C-4 airborne geophysical anomaly where ground follow-up included magnetometer and HLEM surveys and diamond drilling. Two holes were drilled totalling 130 m. They cut mainly quartz-biotite (±muscovite) schist. Both holes intersected an amphibolite dyke 2.5 to 10 m wide, but did not cut iron formation. Core was not sampled.



Hole No	Claim	Grid Coordinates	Azimuth	Dip	Depth(m)
J87-1	TANIA	4+00N, 0+80E	285	-45	98.15
J87-2	TANIA	5+60N, 0+35E	285	-45	99.67
J87-3	TANIA	8+80N, 1+00E	285	-45	151.49
J87-4	TANIA	11+20N, 1+65E	285	-45	102.72
J87-5	TANIA	13+60N, 1+90E	285	-45	102.72
J87-6	TANIA	15+20N, 2+25E	285	-45	60.31
					615.06 m

FIGURE 8-41: JOYCE, PATRICIA and TANIA claims and grids.

JOYCE, PATRICIA AND TANIA CLAIMS

Pamorex Minerals Ltd.	Gold
c/o Giant Yellowknife Mines Ltd.	76 E/14
Box 3000, Yellowknife, NWT	66°46'N to 66°50'N
X1A 2M2	111°02'W to 111°14'W

REFERENCES

Bostock (1980); Fraser (1964); King *et al.* (1988); Tremblay (1976).

DIAND assessment report: 082511.

PROPERTY

JOYCE 2-7, PATRICIA, TANIA.

LOCATION

The centre of the property is roughly 405 km northeasterly of Yellowknife, and 3.5 km northeasterly of Lupin Mine (Fig. 8-41). The waters of Contwoyto Lake cover most of the property.

HISTORY

Gold discoveries is 1960, in the northern Contwoyto Lake area, by Canadian Nickel Company Ltd. resulted in a staking rush in 1961. Numerous assessment reports were filed on work done in the 1960's.

A second staking rush commencing in 1982 resulted from the start of mining operations by Echo Bay Mines at Lupin Mine. The PATRICIA and TANIA claims were recorded in June 1985 by W.J. Humphries and the JOYCE claims in October 1985 by G. Sage. The JOYCE, PATRICIA and TANIA claims were transferred to Pamorex in October 1987.

DESCRIPTION

More than half of the PATRICIA and of the TANIA claim is water-covered and only about 5% of the JOYCE claim block is above water (Fig. 8-41). Yellowknife Supergroup metasediments and Archean granitoid rocks outcrop on the southwestern side of Contwoyto Lake. The granitoids were mapped by Tremblay (1976) as biotite-muscovite granite. The same rocks were remapped in part by King *et al.* (1988) and described as biotite granodiorite to syenodiorite. Quartzite and argillite (including concretionary red argillite), lower units of the Aphebian Western River Formation outcrop in the northeastern part of the property on JOYCE 4 and 5 claims. Helikian diabase dykes of the Mackenzie Swarm trend north-northwesterly through the property cutting both Archean and Aphebian rocks.

The Archean sediments have been completely folded during several periods of deformation (King *et al.*, 1988).

The cordierite isograd trends northeasterly from slightly north of Lupin Mine and presumably continues northeasterly under Contwoyto Lake and Proterozoic sediments in the northeastern corner of the property. Thus granitoids and Archean metasediments of amphibolite facies will mainly underlie the northwestern half of the property, and greenschist facies metasediments will underlie the southeastern half.

CURRENT WORK AND RESULTS

In the spring of 1987 two grids with north-northeasterly base lines (Grids A and B) were constructed, mainly on the ice of Contwoyto Lake. The grids were explored by horizontal loop EM and magnetometer surveys. Fifteen major conductive trends and several minor trends were delineated. Most conductive trends had either coincident or flanking magnetic anomalies. The conductive trends are probably caused by sulphide-bearing iron-formation, which in the southwestern part of the A Grid may be on strike extensions of iron formation at Lupin Mine.

GOLD CLAIMS

Cominco Ltd.
Suite 700, 409 Granville St.
Vancouver, B.C., V6C 1T2

Gold
76 E/14,15
65°51'N, 110°58'W

REFERENCES

Bostock (1980); Fraser (1964); Tremblay (1976).

DIAND assessment reports: 017156, 017147, 082049, 082135, 082516, 082577.

PROPERTY

GOLD 1-4.

LOCATION

The property (Fig. 8-32) is centred 415 km northeasterly of Yellowknife and 15 km northeasterly of Lupin Mine.

HISTORY

GOLD 1, recorded for Hidden Lake Gold Mines Ltd. in March 1983, covers much of the ground held as the ROX 1-54 in the early 1960's by Conwest Exploration Ltd. Conwest optioned these claims to Falconbridge Nickel Mines Ltd., who in 1962 explored them by 1:31 680 geological mapping and by prospecting (DIAND assessment report 017147). The ROX claims subsequently lapsed.

Hidden Lake Gold Mines Ltd. conducted an airborne geophysical (DIGHEM) survey of GOLD 1 in 1984 (DIAND assessment report 082049).

Prospecting Permit 35, which covered NTS 76 E/15 was issued to Canadian Nickel Company Ltd. in 1962 and expired in 1965. Canadian Nickel Company geologically mapped the permit area and explored selected parts by geophysical surveys (DIAND assessment report 017156).

Cominco Ltd. acquired GOLD 1 from Hidden Lake Gold Mines in 1986. In April 1986 Cominco recorded GOLD 2-4, which extend 18 km northeasterly from GOLD 1.

DESCRIPTION

The claims are underlain in order of relative abundance by Archean metasediments of the Contwoyto Formation of the Yellowknife Supergroup, Archean granite, gabbro and Helikian diabase dykes of the northwesterly trending Mackenzie Swarm. Aphebian sediments of the Western River Formation underlie the northwestern corner of the property on GOLD 4. The southeastern part of GOLD 4 is underlain by granite, part of a pluton which lies mainly east and southeast of the property. Dykes and plugs of granite outcrop elsewhere on the property.

The Contwoyto Formation locally contains zones of silicate facies, sulphide facies and garnet-amphibolite iron formation. The Contwoyto Formation metasediments trend northerly to northeasterly.

GOLD 2 claim is largely covered by the waters of Contwoyto Lake.

CURRENT WORK AND RESULTS

In 1986, Cominco explored the GOLD 1 claim by geological mapping and prospecting, magnetometer and VLF EM surveys over a grid with a north-northeasterly baseline. The baseline extends right across the peninsula covered by GOLD 1. Several north-northeasterly trending weakly sulphidic amphibolitic iron formations were delineated which locally are coincident with, or flanked by, magnetic anomalies and conductors outlined by surface and airborne geophysical surveys. The iron formation is locally enriched in sulphides, and auriferous.

In 1987 GOLD 2, 3 and 4 were explored by an airborne (DIGHEM) geophysical survey and geological mapping was done on a grid covering most of GOLD 3 and 4 claims. Iron formations were mapped trending generally north-northeasterly through the grid. They were found to have only low gold content.

Mapping showed the metasediments in the northeastern part of the grid (on GOLD 3 an 4) to be locally cordierite and staurolite bearing in contrast to the greenschist facies sediments on GOLD 1 where these minerals are not found.

Three diamond drill holes totalling 229 m on GOLD 1 (Fig. 8-32) explored conductive zones. Sulphidic iron formation was intersected, but was only weakly auriferous.

CUB, F23, RUSH Claims, PROSPECTING PERMIT 1074

Echo Bay Mines Ltd.
354 Granville Sq.
200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
86 H/10
65°32'-65°45'N
112°30'-112°58'W

REFERENCES

Bau *et al.* (1979); Bostock (1980); Seaton and Hurdle (1978); Seaton *et al.* (1987).

DIAND assessment reports: 080585, 081800, 081865, 081899, 081968, 082050, 082065, 082120, 082153, 082498, 082499, 082500, 082501, 082579, 082581, 082582.

PROPERTY

CUB 1-4; F23; RUSH 1-9; Prospecting Permit 1074.

LOCATION

The claims and prospecting permit are 350 to 380 km north-northeasterly of Yellowknife. They form a single block at or near Itchen Lake (Fig. 8-42).

HISTORY

References to the early exploration history which goes back to 1962, may be found in Seaton *et al.* (1987) and in Seaton and Hurdle (1978).

Most assessment work cited in this report is by Echo Bay Mines. Noranda Exploration Company Ltd. held the southwestern corner of the Prospecting Permit 1074 area as the BOW claims that were staked in 1975 (DIAND assessment report 080585).

Echo Bay Mines recorded F23 in April 1983, CUB 1 in September 1983, RUSH 1 in August 1984, CUB 2 on October 1984, RUSH 2, 3 in August 1985, CUB 4 and RUSH 4, 5 in November 1985 and RUSH 6-9 (staked to secure parts of 86 H/10 NE on release of Prospecting Permit 1074 on January 1, 1987) in July 1986. Prospecting Permit 1074 was granted on February 1, 1985. A 1985 airborne (DIGHEM) geophysical survey over the property outlined numerous anomalies.

DESCRIPTION

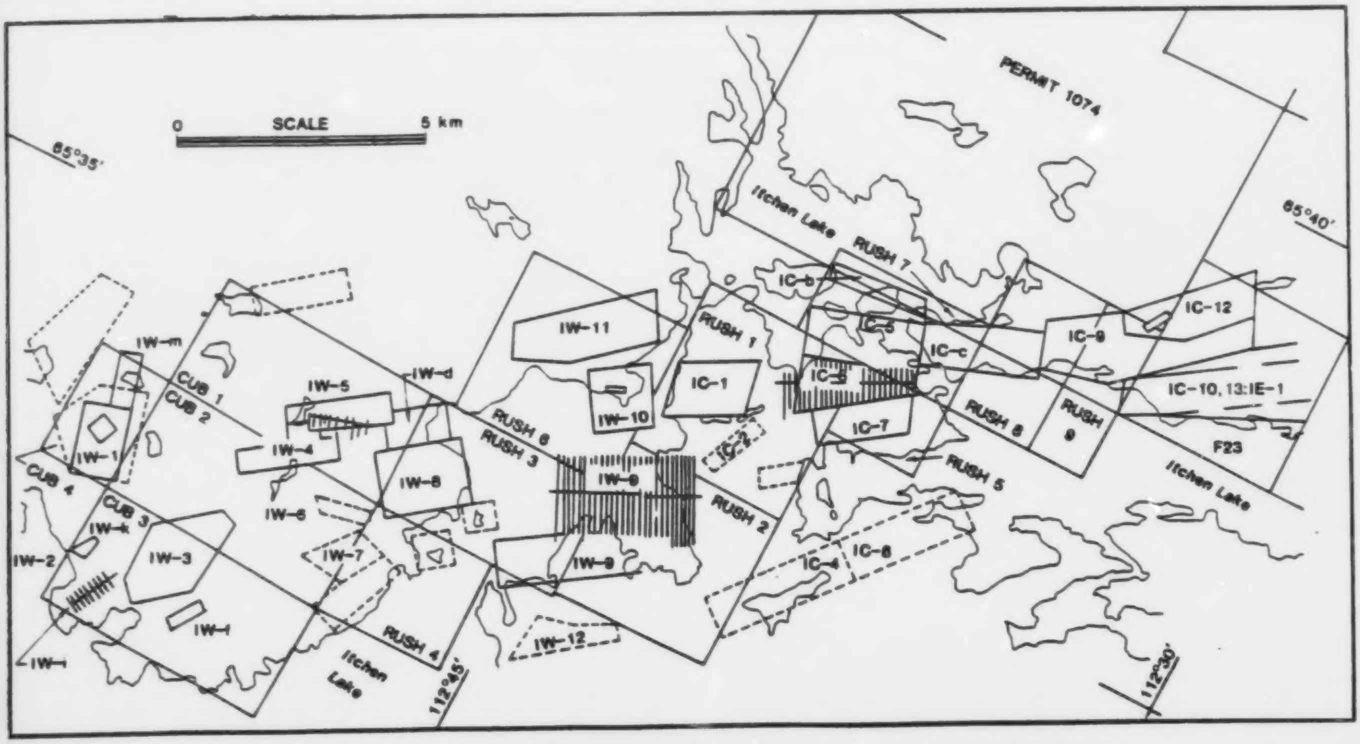
The regional geology is shown at 1:250 000 in Bostock (1980). Ban and others (1979) mapped 86 H/10 at 1:31 680. Iron formation in the Contwoyto Formation is locally sulphidic and auriferous and is the target of current exploration.

CURRENT WORK AND RESULTS

Work on the property in 1986 and 1987 included ground follow-up of anomalies outlined by the 1985 airborne geophysical survey (Table 8-6). Follow-up included prospecting, 1:15 000 geological mapping, VLF EM and magnetometer surveys.

On CUB 1-4 in 1986, 30 DIGHEM anomalies were explored by geological mapping and prospecting, and of these, 13 were tested by magnetometer and VLF EM surveys.

In 1987 the IW5 target area on CUB 1 was explored by 1:1000 geological mapping, and four trenches were excavated and sampled. The best trench sample assayed 7.75 g/t Au across 1.35 m. The target was also tested by a magnetometer survey. Three anomalies on CUB 3 were followed-up by



0 SCALE 5 km
65°35'
PERMIT 1074
Itchen Lake
RUSH 7
65°40'
IC-b
IC-12
IW-11
RUSH 1
IC-5
IC-c
IC-9
IW-m
IW-d
IC-1
IC-3
IC-10, 13:IE-1
CUB 1
CUB 2
IW-5
RUSH 6
RUSH 3
IW-10
RUSH 8
RUSH 9
IC-7
IC-2
F23
IW-1
IW-4
IW-8
IW-9
RUSH 5
CUB 4
CUB 3
IW-k
IW-6
RUSH 2
Itchen Lake
IW-2
IW-3
IW-7
IW-9
IC-4
IC-6
IW-l
RUSH 4
IW-12
IW-i
Itchen Lake
112°45'
112°30'

FIGURE 8-42: CUB, F23 and RUSH claims, and Prospecting Permit 1074 grids and anomalies.

TABLE 8-6: SUMMARY OF 1986 AND 1987 WORK ON CUB, F23 AND RUSH CLAIMS AND PROSPECTING PERMIT 1074

CLAIM #	OCCUR. #	DRILLING # HOLES: M	# SAMPLES	# ANOM.	GRID KM.	MAPPING	MAG KM.	MAXMIN KM.	# TRENCHES	OCCUR. NO.	PROSP. SAMP.	NO. OF ANOM	GRID KM.	MAP SCALE	MAG KM.
CUB 4										IW-1	27	1	.4	1: 1000	5.0
CUB 3										IW-3/3a	73	0		1: 15000	
CUB 2										IW-4	18	0		1: 15000	
CUB 1	IW-5		53	15	19.7	1: 1000	19.7	1.82	4	IW-5	46	6		1: 15000	
RUSH 3										IW-8	29	1		1: 15000	
RUSH 2,3	IW-9	10:733			166.5		166.5	38.8		IW-9	27	0		1: 1000	
RUSH 6										IW-10	28	0	.36	1: 1000	2.1
RUSH 6										IW-11	5	0		1: 15000	
RUSH 3										IW-d	4	–			
CUB 3										IW-f	3	0		1: 15000	
CUB 3	IW-k		6	0						IW-k	–	–			
CUB 4										IW-m	[illegible]	0		1: 15000	
CUB 3	IW-i		6	0											
CUB 3	IW-2		20	1	9.2	1:2000	9.2								
CUB 2	IW-6		10	0											
CUB 2	IW-7		4	0											
OPEN	IW-12		1	0											
RUSH 1										IC-1	27	0		1: 15000	SPOT
RUSH 1,7										IC-15	16	0		1: 15000	
RUSH 1,5	IC-6		90	0	74.2	1: 1000	74.2	4.3		IC-6	18	1		1: 1000	
RUSH 5										IC-7	17	0		1: 15000	
RUSH 8,9										IC-9	56	2		1: 15000	
F23										IC-10	13 10	0		1: 15000	
F23										IC-12	90	1	.52	1: 1000	2.32
P.P. 1074										IC-g	13	0		1: 15000	
RUSH 8										IC-c	39	1		1: 15000	
F23	IC-g		17	0		1: 15000				IC-g	–	–			
RUSH 1	IC-2		3	0											
RUSH 1	IC-3		5	0											
OPEN	IC-4		5	0		1: 15000									
OPEN	IC-8		3	0		1: 15000									
RUSH 1	RUSH	7:480.9													

sampling and prospecting and two of these were surveyed by magnetometer. Only minor amounts of iron formation were found and these had strictly localised gold concentrations.

On Prospecting Permit 1074 one gold showing was found in 1985 as a result of prospecting, sampling, geological mapping, magnetometer and VLF EM surveys of DIGHEM anomalies. Claims were also staked as a result of this work.

Work in 1986 on the F23 claim included prospecting, geological mapping and magnetometer surveys.

On RUSH 1-9, 34 DIGHEM anomalies were investigated on the ground. All 34 were explored by prospecting and 1:15 000 geological mapping. Grids were constructed over four of the anomalies. Detailed (1:1000) mapping and magnetometer surveys were conducted on the grids.

Four gold showings were found in 1986 and six areas were outlined for detailed work in 1987.

In 1987 diamond drilling tested targets on the CUB 1 and RUSH 5 claims.

INDIN LAKE AREA

The Indin Lake supracrustal belt, centred on Indin Lake, is near the western margin of the Slave Structural Province, 200 km north-northwest of Yellowknife. Irregular, generally north-trending belts of Archean Yellowknife Supergroup rocks, dominantly basaltic volcanic rocks, turbiditic greywackes and mudstones (Figs. 8-43, 8-44) of 2669 ± 15 Ma age (Frith and Loveridge, 1982) form the Indin Lake belt. Intervening areas are made up of hybrid rocks derived from both basement granitoid and supracrustal rocks as well as plutonic rocks, generally granite or granodiorite. Metamorphic grade varies from greenschist in the centre of the belt to upper amphibolite facies at the margins. Proterozoic rocks include north-trending diabase dykes, some plutonic rocks and pegmatites (Frith, 1986). The Geological Survey of Canada began mapping the area following the first gold discovery, the Barker vein near the southern end of Indin Lake, in 1938. In 1939 Lord (Lord, 1942) mapped the west half of the Indin Lake area at 1 inch to 4 mile scale and in 1948 Fortier (Fortier, 1949) mapped at the same scale the east half of the Indin Lake area (Fig. 8-45). Mapping at 1 inch to 1 mile scale in the central part of Indin Lake was carried out at Chalco Lake (86 B/6) by Stanton *et al.* (1954), Ranji Lake (86 B/3) by Tremblay *et al.* (1953) and Ghost Lake (85 O/14) by Wright (1954). During 1972-74 Frith mapped the belt at 1:125 000 (Fig. 8-45; Frith, 1986).

There are many gold showings in the area (Morgan, 1988; Frith, 1986). Gold-bearing veins are typically grey quartz or quartz-carbonate and contain pyrite, pyrrhotite or arsenopyrite. Gold is mostly fine and not readily observed in outcrop. Individual gold-bearing veins, stringers, lenses or stockworks cross-cut Archean Yellowknife Supergroup rocks and related synvolcanic dykes and sills, but are not found cutting Proterozoic diabase. Gold content is generally higher in veins within volcanic strata. Most veins parallel bedding and groups of veins often occupy shear zones such as those developed along the volcanic-sedimentary interface and in the metasediments and metavolcanics near the volcanic-sedimentary contact.

Exploration in the 1940's led to gold discoveries including North Inca, Diversified, Leta Arm, Lex Lake Main zone (formerly the A zone), Spider Lake-Treasure Island and Colomac (Fig. 8-43). Exploration in the 1970's was primarily for volcanogenic base metal massive sulphide deposits; thus, large airborne geophysical surveys were commissioned by Freeport Oil Company Ltd. in 1970 and by Great Plains Development Company of Canada Ltd. in 1971. Subsequently, limited ground follow up, including drilling, located narrow, weakly mineralised argillite and graphitic zones. The tremendous increase in gold price in 1980 prompted renewed interest in gold potential of the area. In late 1984 Echo Bay and partners announced a new discovery, an extension of the Lex Lake property on the KIM claims and in 1985 the Cass discovery (Fig. 8-43).

Colomac is a high-tonnage, low-grade gold deposit. Discovered in 1945, it was explored during 1946-47 by 21 828 m of drilling in 155 holes and by 762 m of drifts and crosscuts to obtain a bulk sample. Auriferous zones are hosted by the Colomac dyke, which is actually a rotated sill, within a series of multiphase diorite to quartz diorite, synvolcanic sills that intrude intermediate and minor felsic volcanic rocks and sediments along the west shore of Baton Lake. A preliminary date for the sill is 2671 ± 10 Ma (Mortensen, 1989, pers comm.). The Colomac sill is a medium-grained, quartz albite porphyry, brittly deformed to produce fracture stockworks and quartz-veined zones that are chloritized, silicified, carbonatized and contain up to 5% pyrrhotite. Gold is in fine fractures and along selvages of quartz veins, rarely within quartz in veins. Thus, gold content is dependent upon fracture density. The Colomac sill is steeply east dipping to near vertical and has a north-trending strike length of 6 km and varies in width along strike from 9 to 60 m, averaging 30 m. Another sill, Goldcrest, 300 m to the west of the Colomac sill, has a strike length of 1000 m and varies in width from 20 to 70 m. Texturally and physically it is similar to the Colomac sill and contains auriferous zones (Fig. 8-46).

Geological reserves of the Colomac deposit have been defined by 1946-47 exploration, a further 20 holes drilled for 2878 m in 1974 by Cominco Ltd., and in 1987, 10 811 m in 138 holes by Neptune Resources Corp. Estimated geologic reserves are 25 Mt grading 1.9 g/t Au. The potential of the sills continues to be explored by drilling.

SPIDER LAKE PROPERTY

International Mahogany Corp. Gold
P.O. Box 10326, Pacific Centre 86 B/6,11
2470, 609 Granville St. 64°30'N, 115°10'W
Vancouver, B.C., V7Y 1G5

REFERENCES

Frith (1986); Lord (1942, 1951); Padgham *et al.* (1978); Seaton *et al.* (1985); Stanton *et al.* (1954).

DIAND assessment reports: 017382, 017734, 019699, 062065, 062141, 081680, 081928, 082107, 082604.

PROPERTY

BOOTY 1, DAN 9, 13, 14, 19, EAEC 1, JOHN, KEN 1, LONG, LOOT 1, MIDAS, MIDAS 1-3, PEGLEG 1 and 2, POLLY, RON 1, YAK 1 and 2. The property is under joint venture with Treasure Island Resources Corp.

LOCATION

The claims form a single block at Spider Lake (Fig. 8-44). They are 235 km north-northwest of Yellowknife.

HISTORY

Gold was discovered in the Spider Lake area in 1945. That year the FLY No. 1 and FLY No. 2 groups were staked for Trans-American Mining Corporation Ltd. and the adjacent H.C., LUX, MEX and TEX claim groups for Springer Sturgeon Gold Mines Ltd. Trenching and sampling were performed by both companies in the fall of 1945 (DIAND assessment reports: 017382, 062065). Spinet Mining Company Ltd. acquired the Trans-American and Springer Sturgeon claims in January 1946 and was succeeded by Spinet Gold Mines Ltd. in October 1946. In 1946 and 1947 Spinet Gold Mines explored their property mainly by drilling 5550 m of core on the south shore of Treasure Island. This defined the North, South and East zones, on Treasure Island.

In 1960 the DAN group, on and south of Treasure Island, was staked and an airborne radiometric survey of DAN 9, 10, 13, 15, 19, 20, 23, and DAN X was performed in 1969 (DIAND assessment report 060413). DAN 9, 13, 14, 19 were converted to a mining lease in 1972.

In 1967 Giant Yellowknife Mines Ltd. staked 18 JERRY claims west of Treasure Island on what is now the LONG and PEGLEG claims. Giant Yellowknife Mines mapped and sampled the peninsula east of Treasure Island and an area at the eastern end of Laurie Lake (DIAND assessment report 017734).

In 1970 Seigel Associates Ltd. flew a geophysical survey of the Damoti-Indin-Spider lakes area for Freeport Oil Company (Alberta) Ltd. to delineate volcanogenic massive sulphide targets (DIAND assessment report 060412). Subsequent staking included the PETER claims at the south end of Spider Lake on which one diamond drill hole intersected chalcopyrite and sphalerite in a graphitic argillite, that assayed 0.45% Zn, 0.4% Cu and 2.1 g/t Ag over 4.4 m and 0.5% Zn, 0.06% Cu and 2.4 g/t Ag over 3 m (Padgham *et al.*, 1978; DIAND assessment report 019699).

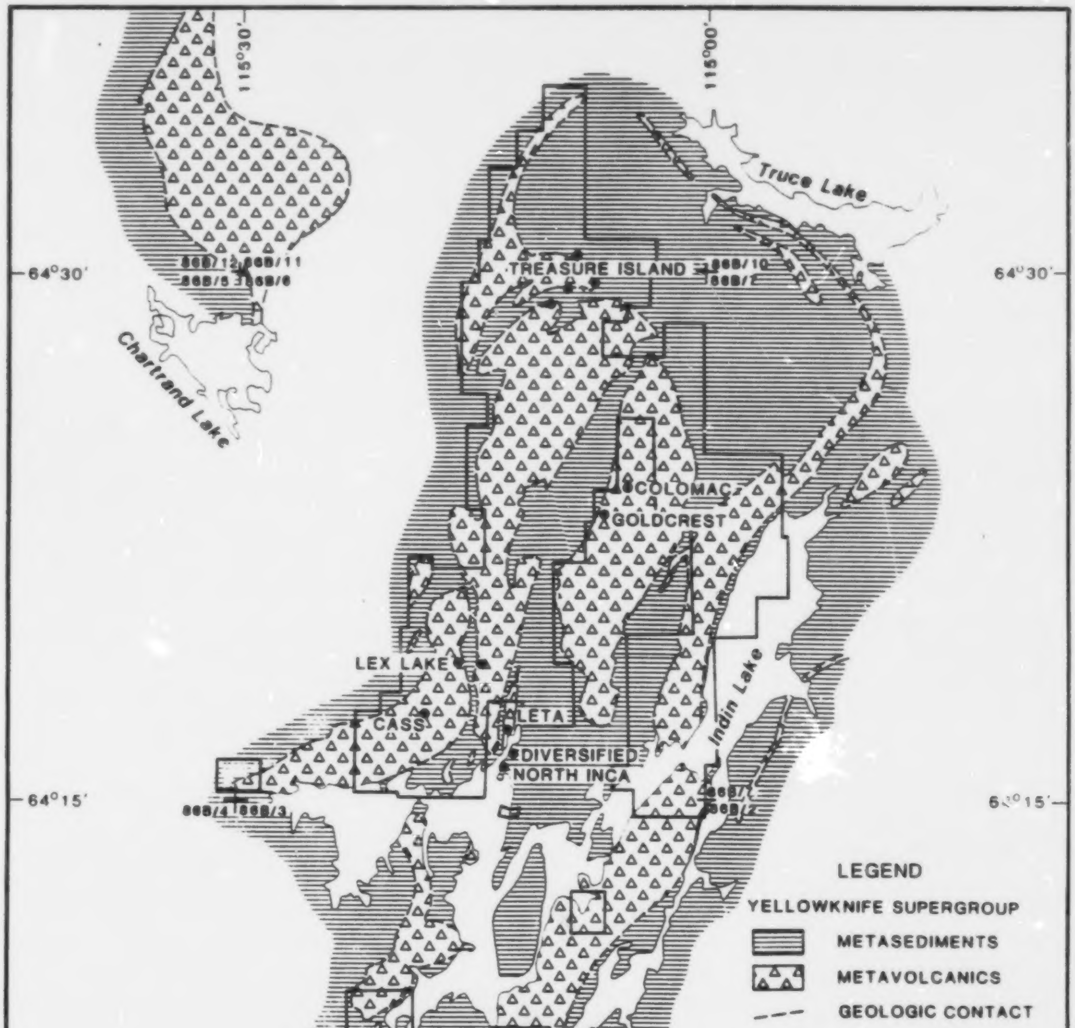
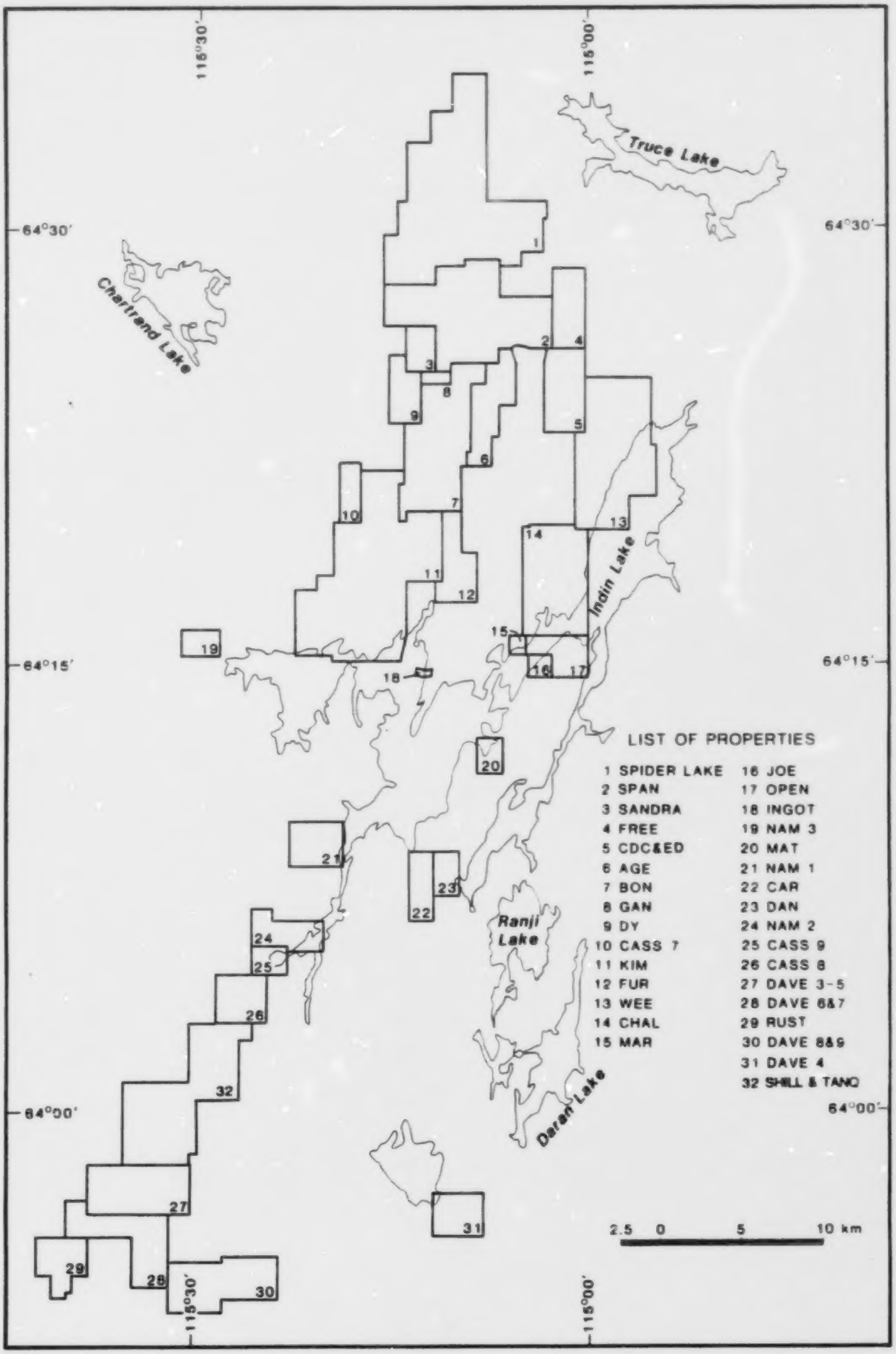

115°30'
115°00'
Truce Lake
86B/12
86B/11
86B/5
86B/6
TREASURE ISLAND
86B/10
86B/7
64°30'
Chartrand Lake
COLOMAC
GOLDCREST
LEX LAKE
CASS
LETA
DIVERSIFIED
NORTH INCA
Indin Lake
64°15'
86B/4
86B/3
86B/7
86B/2
LEGEND
YELLOWKNIFE SUPERGROUP
METASEDIMENTS
METAVOLCANICS
GEOLOGIC CONTACT
GOLD DEPOSIT
CLAIM BOUNDARIES DESCRIBED IN THIS REPORT
Ranji Lake
64°00'
85O/13
85O/14
Daran Lake
86B/2
85O/15
2.5
0
5
10 km
115°30'
115°00'

FIGURE 8-43: Geology, gold deposits and outline of claim boundaries where 1986-87 work is reported in the Indin Lake area.


115°30'
115°00'
64°30'
64°15'
64°00'
Truce Lake
Chartrand Lake
Indin Lake
Ranji Lake
Daran Lake
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
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25
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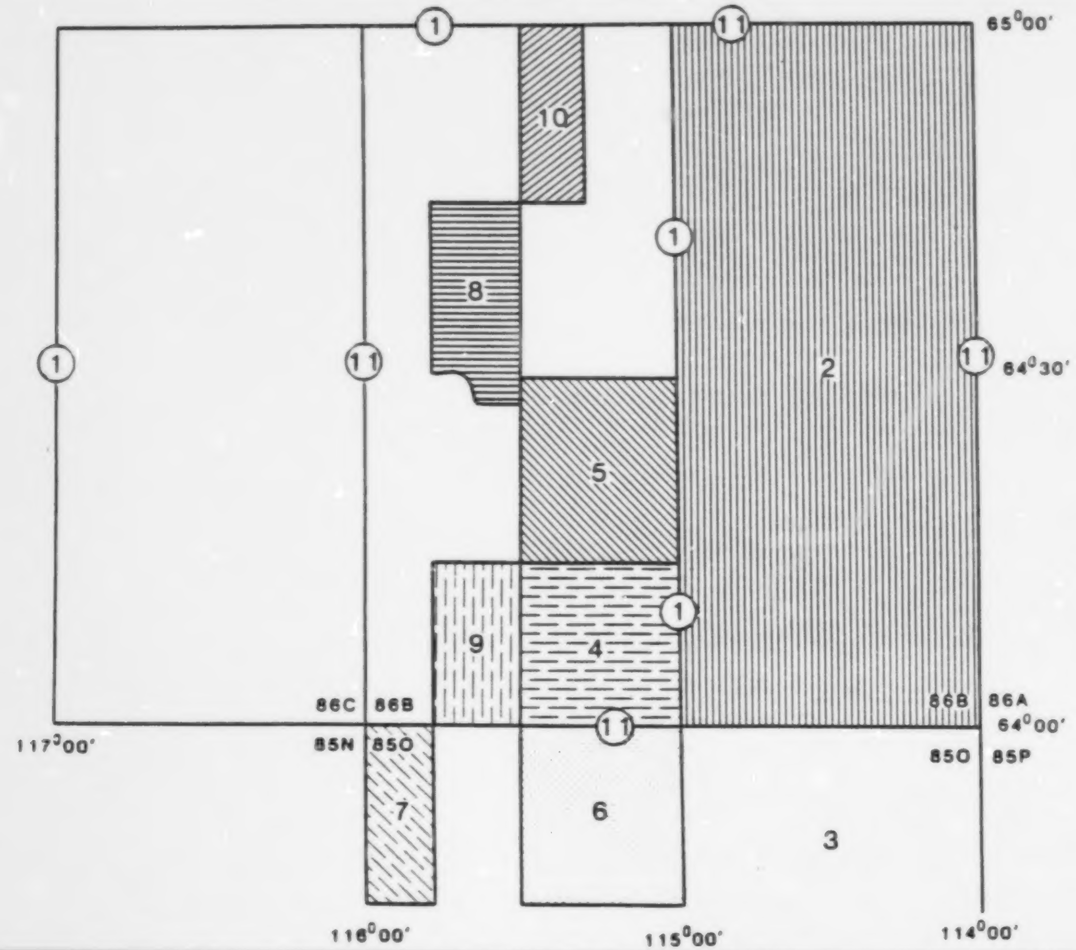
31
32
LIST OF PROPERTIES
1 SPIDER LAKE
2 SPAN
3 SANDRA
4 FREE
5 CDC&ED
6 AGE
7 BON
8 GAN
9 DY
10 CASS 7
11 KIM
12 FUR
13 WEE
14 CHAL
15 MAR
16 JOE
17 OPEN
18 INGOT
19 NAM 3
20 MAT
21 NAM 1
22 CAR
23 DAN
24 NAM 2
25 CASS 9
26 CASS 8
27 DAVE 3-5
28 DAVE 6&7
29 RUST
30 DAVE 8&9
31 DAVE 4
32 SHILL & TANO
2.5 0 5 10 km

FIGURE 8-44: *Properties in the Indin Lake area where 1986-87 work is reported.*



No[1]	Area (NTS)	Reference	Scale
1[2]	86 B (west half) 86 C (east half) Snare River and Ingray Lake	Lord, C.S. (1942), Snare River and Ingray Lake Map areas, NWT. GSC Memoir 235, Maps 690A, 697A	1:253 440
2[2]	86 B (east half) Indin Lake	Fortier, Y.O. (1949), Indin Lake Map Area (East Half) Northwest Territories. GSC Paper 49-10	1:126 720
3[2]	85 O/15, 16 Wecho River	Yardley, D.H. (1949), Preliminary Map, Wecho River (East Half) NWT. GSC Paper 49-14	1:126 720
4[2]	86 B/3, part 4 Ranji Lake	Tremblay, L.P. et al (1953), Ranji Lake, NWT. GSC Map 1022A	1:63 360
5	86 B/6, part 5 Chalco Lake	Stanton, M.S., et al (1954), Chalco Lake, NWT. GSC Map 1023A	1:63 360
6[2]	85 O/14 Ghost Lake	Wright, G.M. (1954), Ghost Lake, NWT GSC Map 1021A	1:63 360
7	85 O/15 (west half) Basler Lake	McGlynn, J.C. and Ross, J.V., (1962), Geology, Basler Lake, District of Mackenzie. GSC Map 18-1962	1:63 360
8	86 B/12 Arseno Lake	McGlynn, J.C. (1963), Arseno Lake map area, District of Mackenzie. GSC Paper 63-26	1:63 360
9	86 B/4 (part) Mattbury Lake	Smith, P.H. (1963), Geology, Mattbury Lake, District of Mackenzie. GSC Map 44-1963	1:63 360
10	86 B/14 (west half) Mesa Lake	Ross, J.V. (1966), The structure and metamorphism of Mesa Lake map area, District of Mackenzie. GSC Bulletin 124, Map 1173A	1:63 360
11[2]	86 B Indin Lake	Frith, R.A. (1986), Archean geology, Indin Lake map area, District of Mackenzie, Northwest Territories. GSC Open File 1243	1:125 000

[1] Refers to Figure.
[2] Blueline prints of these maps are available from the NWT Geology Division, DIAND, Yellowknife.

FIGURE 8-45: Geologic maps for the Indin Lake area.

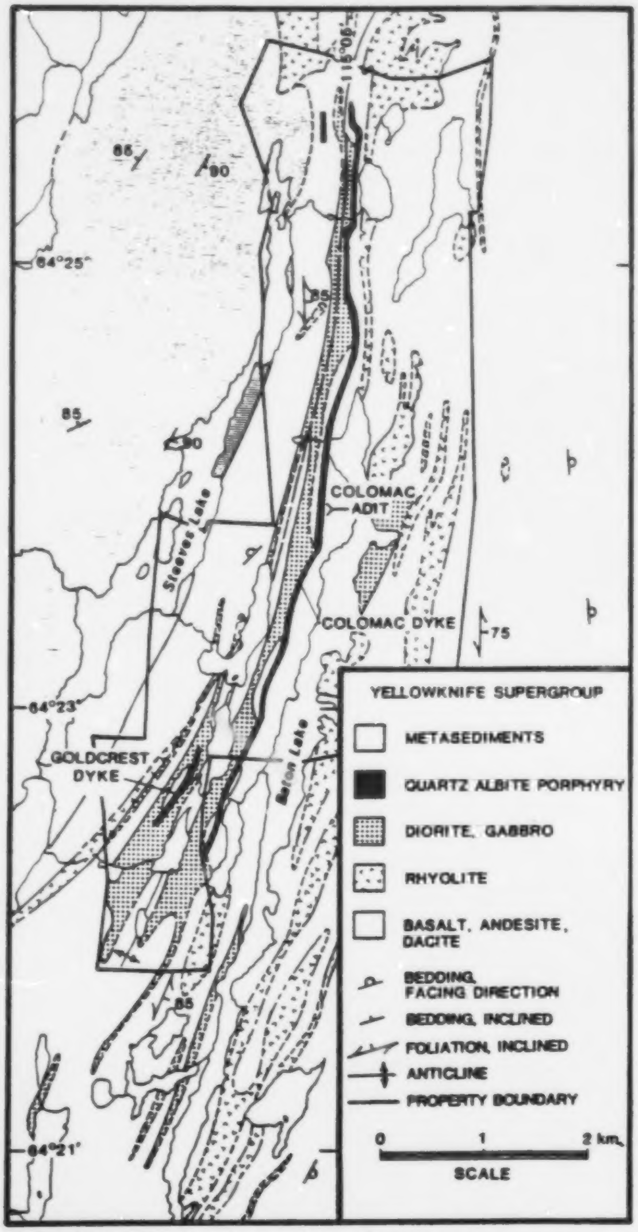


***FIGURE 8-46:** Geology of the Colomac area.*

Treasure Island Resources Corp. recorded EAEC 1 in October 1978, BOOTY 1 in December 1979, LOOT 1 in February 1980, PEGLEG 1 and 2 in January 1983, LONG and JOHN in April 1983 and optioned DAN 9, 13, 14, 19 and the YAK 1 and 2 in 1980. During spring 1983 Treasure Island Resources Corp. geologically reconnoitred EAEC 1 (DIAND assessment report 081680) and drilled 8 holes totalling 920 m in the Treasure Island showing area and calculated a reserve of 128 368 t grading 14.1 g/t Au with an additional 37 478 t grading 4.4 g/t Au.

In May 1985 Suncor Inc. optioned the property. Suncor recorded POLLY in April 1985, MIDAS 1-4 in June 1985 and KEN 1 and RON 1 in August 1985. In 1985 exploration by Suncor included extensive prospecting, sampling, geological mapping and VLF EM and magnetometer surveying (DIAND assessment report 081928). In addition an airborne VLF EM and magnetometer geophysical survey was conducted over the area by DIGEM. In 1987 Suncor withdrew from exploration and Treasure Island Resources Corp. optioned the property to International Mahogany Corp.

DESCRIPTION

The Spider Lake property is at the north end of the Indin Lake supracrustal belt (Figs. 8-43, 8-44). The area is underlain by isoclinally folded predominantly mafic metavolcanics and metasediments flanked by granitoid gneiss. Metavolcanics include massive basalt flows, pillowed basalt, and felsic volcanics mapped on JOHN and YAK 1 and the northwestern part of LONG (Stanton *et al.*, 1954). Granitoids underlie parts of LONG and MIDAS 1-4 on the northwestern border of the property.

Metasediments are chiefly greywacke locally porphyroblastic and, close to the volcanic contact, are often interbedded with argillite which is commonly graphitic and pyritic. Metasediments underlie the northern arms of Spider Lake on KEN 1, RON 1, POLLY and PEGLEG 2. A belt of metasediments, less than 2 km wide flanked by metavolcanics, diverges from the main exposure (north and east of Spider Lake) and trends westerly to southwesterly through the southern part of Spider Lake and southwesterly through PEGLEG 1 and LONG. Much of the central (Treasure Island) and western parts of Spider Lake area are underlain by metavolcanics, flanked by metasediments to the southeast and granitoid rocks to the northwest (Fig. 8-47).

The outcrop pattern reflects the complex folding and faulting of the area. The property is along a north-plunging anticlinorium that has refolded earlier generations of folds. Treasure Island is on the nose of an east-trending isoclinal fold that plunges toward the east. In the Laurie Lake area, north-northeast-trending isoclinal folds form the flank of the broad north-plunging antiform.

At least two phases of faulting are recognised. Earlier faults are bedding plane shears preferentially developed along metavolcanic-metasediment contacts. Felsic dykes, silicification, quartz veining and mineralisation were localised along these north-northeast-trending shear zones. Later faults cut these shears at a high angle and are characterised by left-lateral displacement and a northwest strike. Helikian-Aphebian diabase and gabbro dykes were intruded along the northwest faults. Dykes vary from less than 1 m to over 100 m in width, and are vertical.

Regional metamorphic grade varies from upper greenschist to upper amphibolite grade. Regional mapping by Frith (1986) projects the cordierite-staurolite isograds through the southern part of the property immediately south of Treasure Island.

On Treasure Island the main showing consists of a number of steep, stratiform zones parallel to the east-northeast structural trend and 100 to 200 m south of the cordierite-isograd. The contact between turbidites and mafic volcanics is locally intruded by the Gamble dyke, an albite biotite porphyry, trending east-northeast through the southern point of Treasure Island. The dyke is 6 to 12 m wide, dips 75° to 85° north and has been traced along strike for 455 m. Its thermal aureole is characterized by biotite and silification and extends out up to 25 m.

Zones anomalous in gold to the north of the dyke are in volcanics and to the south of the dyke in sediments. Within the sediments numerous quartz veins, ranging from erratic stringers to parallel lenses up to 50 cm wide, locally contain 1 or 2% sulphides, including pyrrhotite, pyrite and lesser chalcopyrite,

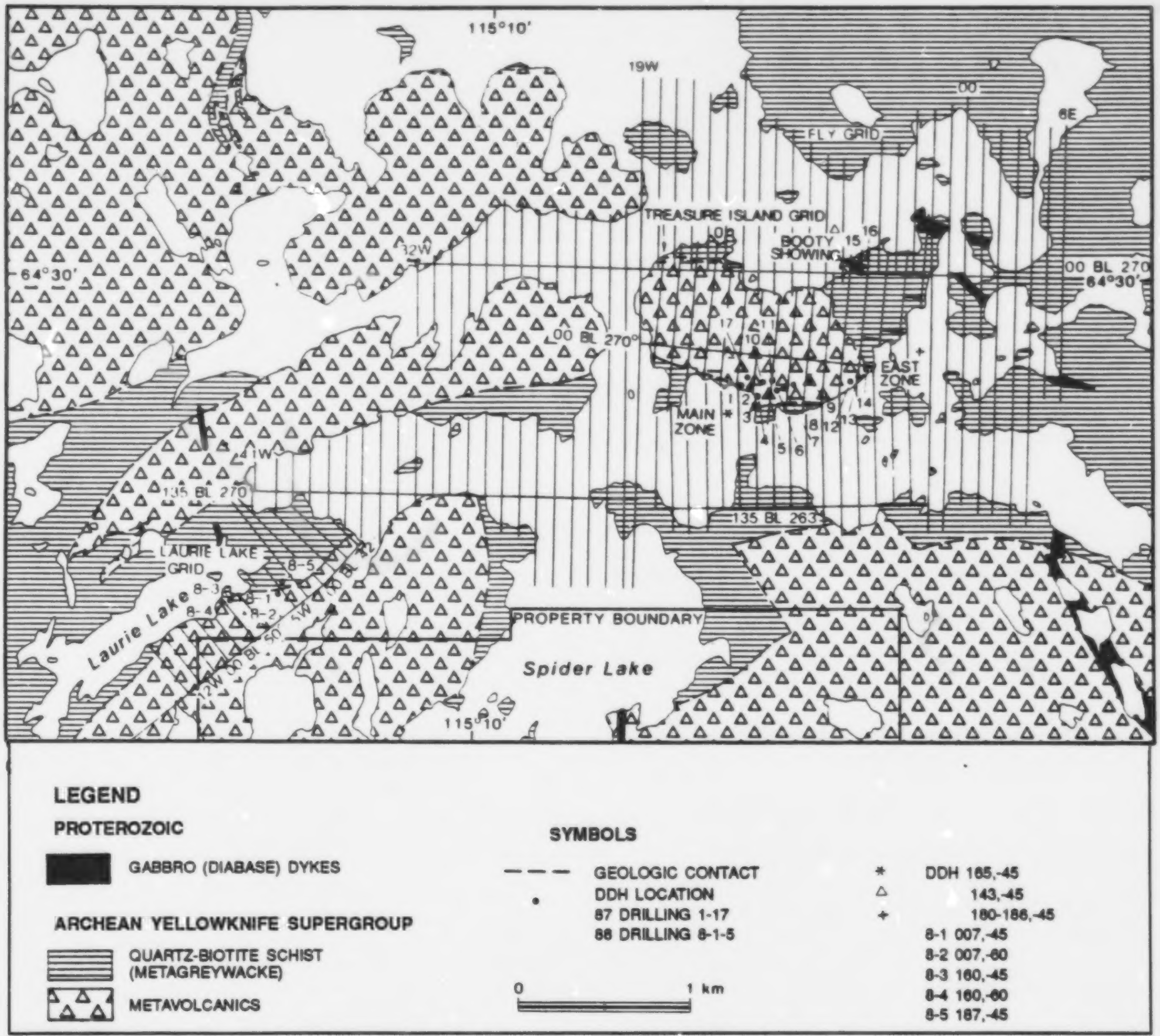

115°10'
19W
00
FLY GRID
6E
TREASURE ISLAND GRID
BOOTY SHOWING
15
16
32W
64°30'
00 BL 270
64°30'
00 BL 270°
17
11
10
EAST ZONE
MAIN ZONE
1
2
3
4
5
6
7
8
9
12
13
14
0
4W
135 BL 270
135 BL 263
LAURIE LAKE GRID
8-5
8-3
8-1
8-4
8-2
Laurie Lake
00 BL 50°
5W
12W
PROPERTY BOUNDARY
Spider Lake
115°10'
LEGEND
PROTEROZOIC
GABBRO (DIABASE) DYKES
ARCHEAN YELLOWKNIFE SUPERGROUP
QUARTZ-BIOTITE SCHIST (METAGREYWACKE)
METAVOLCANICS
SYMBOLS
GEOLOGIC CONTACT
DDH LOCATION
87 DRILLING 1-17
88 DRILLING 8-1-5
0
1 km
DDH 165,-45
143,-45
160-186,-45
8-1 007,-45
8-2 007,-60
8-3 160,-45
8-4 160,-60
8-5 187,-45

FIGURE 8-47: Geology, main mineralised zones, grids and 1987-88 diamond drill hole locations for the Spider Lake property.

sphalerite and galena. These form numerous gossans, many of which have been trenched. Similarly the metavolcanics are silicified and cross-cut by irregular, narrow (<0.5 cm) quartz-carbonate veinlets locally with sulphides. Zones anomalous in gold are generally recognised only by assaying.

CURRENT WORK AND RESULTS

During March and April 1986 Suncor Inc. had the 79 line-km Fly grid put in on Spider Lake and surrounding areas to encompass the Treasure Island grid and link it to the Laurie Lake grid (Fig. 8-47). The 3.8 km east-trending baseline of the Fly grid crosses the northern part of Treasure Island. VLF and magnetometer surveys covered 71.4 line-km and HLEM 10.5 km. Summer 1986 exploration included: geological mapping, prospecting, trenching, collection of 1206 rock chip samples and 1158 soil samples, line cutting, magnetometer and VLF surveys.

Geologic mapping at 1:500 scale covered: North; Central; and South zones, all of which are east striking, steeply (80°) north dipping; East zone, northeast striking; and Booty showing. Fifteen trenches were blasted in the Main showing and six in the Booty. This work identified a westward extension of the South zone and a parallel striking (084°) New South zone.

Geologic mapping at 1:1000 covered: parts of the Fly grid; Peninsula, Isthmus; RON/MIDAS 2 grids; and the Fly and Point showings both in metasediments on the peninsula immediately east of Treasure Island. Exploration to locate an extension of the gold showings found on the south shore of Laurie Lake included sampling, prospecting and limited geologic mapping at 1:2500 scale on the south shore of Spider Lake and on the Laurie Lake grid.

Geophysical surveys included 28.75 line-km of VLF on Peninsula, RON/MIDAS 2 and Isthmus grids and 17.9 line-km of magnetometer read on RON/MIDAS 2 and Isthmus grids.

August 1987 to February 1988 exploration consisted of prospecting including sampling 90 showings, excavation of 11 trenches and 3988.4 m of BQ diamond drilling. Twelve holes tested the Main zone, three holes were drilled in the East zone, two in the Booty showing and five holes at the northeast corner of Laurie Lake (PEGLEG 1, Fig. 8-47). 1987-88 drilling confirmed many of the results of previous work and defined five mineralised zones on the south shore of Treasure Island:

1. North zone with a strike length in excess of 45 m and open to the west. Intersections vary from 3.6 g/t Au over 2.1 m to 7.1 g/t Au over 2.3 m.
2. Central zone, at the northern contact of the Gamble dyke, has a strike length of 330 m. Intersections are very erratic varying from 3.2 g/t Au over 1.5 m to 60.6 g/t Au over 0.5 m.
3. South zone, 15 m south of the Gamble dyke, has a strike length of 230 m, is open at depth and dips steeply (83°) north. Intersections vary from 3.3 g/t Au over 0.6 m to 12.6 g/t Au over 1.3 m.
4. New South zone, parallel to the South zone, has a strike length of 230 m and is open at depth. Intersections vary from 3.3 g/t Au over 0.6 m to 5.2 g/t over 1.9 m.
5. East zone, "B" shoot, has a strike length in excess of 100 m and is open to the east. Intersections vary from 1.89 g/t Au over 1.8 m to 21 g/t Au over 1.7 m.

The drilling on the Booty showing resulted in an intersection of 3.87 g/t Au over 0.9 m. Gold content appears to increase to the west, under Spider Lake. At Laurie Lake, all five holes intersected gold and there appear to be at least two parallel mineralised zones. Intersections in these holes varied from 3.4 g/t Au over 0.6 m to 7.2 g/t Au over 1.4 m.

SPAN 1-5 CLAIMS

Echo Bay Mines Ltd.
354, 200 Granville St.
Vancouver, B.C., V6C 1S4

Gold
86 B/6
64°28'N, 115°10'W

REFERENCES

Frith (1986); Lord (1941, 1951); Seaton *et al.* (1985); Stanton *et al.* (1954).

DIAND assessment reports: 017382, 017734, 060413, 062065, 062141, 081980, 082571.

PROPERTY

SPAN 1-5 (4370 ha).

LOCATION

The claims are south of Spider Lake, 230 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claims are in an area that has been prospected for gold since the late 1930s. Most activity has been focused immediately north in the Spider Lake area. Claims were held by Spinet Gold Mines Ltd. (FLY claims, 1945), Springer Sturgeon Gold Mines Ltd. (LUX, TEX, MEX and HC claims, 1945), Giant Yellowknife Mines Ltd. (JERRY claims, 1967), J.D. Mason (DAN claims, 1970) and, most recently, Treasure Island Resources Ltd. (DAN, EAEC, BOOTY, LOOT and YAK claims, 1983 to present). Further information on this earlier work can be found in Lord (1941, 1951) and in the various DIAND assessment reports listed under REFERENCES.

The SPAN claims were recorded in December, 1984 and are held jointly by Comaplex Resources International Ltd. and Petromet Resources Ltd. The claims cover trenches exposing silicified and mineralised shear zones cutting metasediments and metavolcanics, the Fortune showing, on the Pop grid (DIAND assessment report 081980). In 1986 the property was explored by Wollex Exploration and in 1987 by Echo Bay Mines Ltd. who returned the property to Comaplex and Petromet in December 1987.

DESCRIPTION

The property is underlain by mafic to intermediate metavolcanics which are locally overlain by felsic pyroclastics. The metavolcanic package is juxtaposed against high and low-grade turbiditic metasediment. The assemblage is intruded by a minor amount of Archean gabbro and quartz-albite rock and is cut by diabase dykes (Stanton *et al.*, 1954).

The structure of the area is complex as shown by the trace of the contact between volcanics and sediments (Fig. 8-48).

CURRENT WORK AND RESULTS

In 1986 Comaplex had the claim block prospected and a magnetometer and soil geochemistry survey over the central part of the Pop grid completed. In 1987 the property was optioned to Echo Bay Mines Ltd. who geologically mapped the claim block at 1:10 000, prospected and collected 214 rock and soil samples for assay. Detailed evaluation of showings on the Pop grid included sluicing, channel sampling, detailed mapping and magnetometer survey. Gold is associated with arsenopyrite, pyrrhotite, and pyrite in structurally complex quartz lenses, ranging up to 4.6 m wide and 12.2 m long, within a carbonitised shear zone that can be traced over a strike length of 140 m. A total of 258 sawed channel samples averaging 1 m in length assayed up to 74 g/t Au. Results from diamond drilling 10 holes for 632 m of core, designed to test the zone at vertical depths of from 53 to 61 m, returned up to 4.8 g/t Au over a core length of 1 m.

SANDRA CLAIM

Frontier Gold Mines Ltd.
1029 Bel-Air Dr. SW
Calgary, Alta., T2V 2C1

Gold
86 B/6
64°26'N, 115°12'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).

DIAND assessment reports: 081886, 082487.

PROPERTY

SANDRA claim (502 ha).

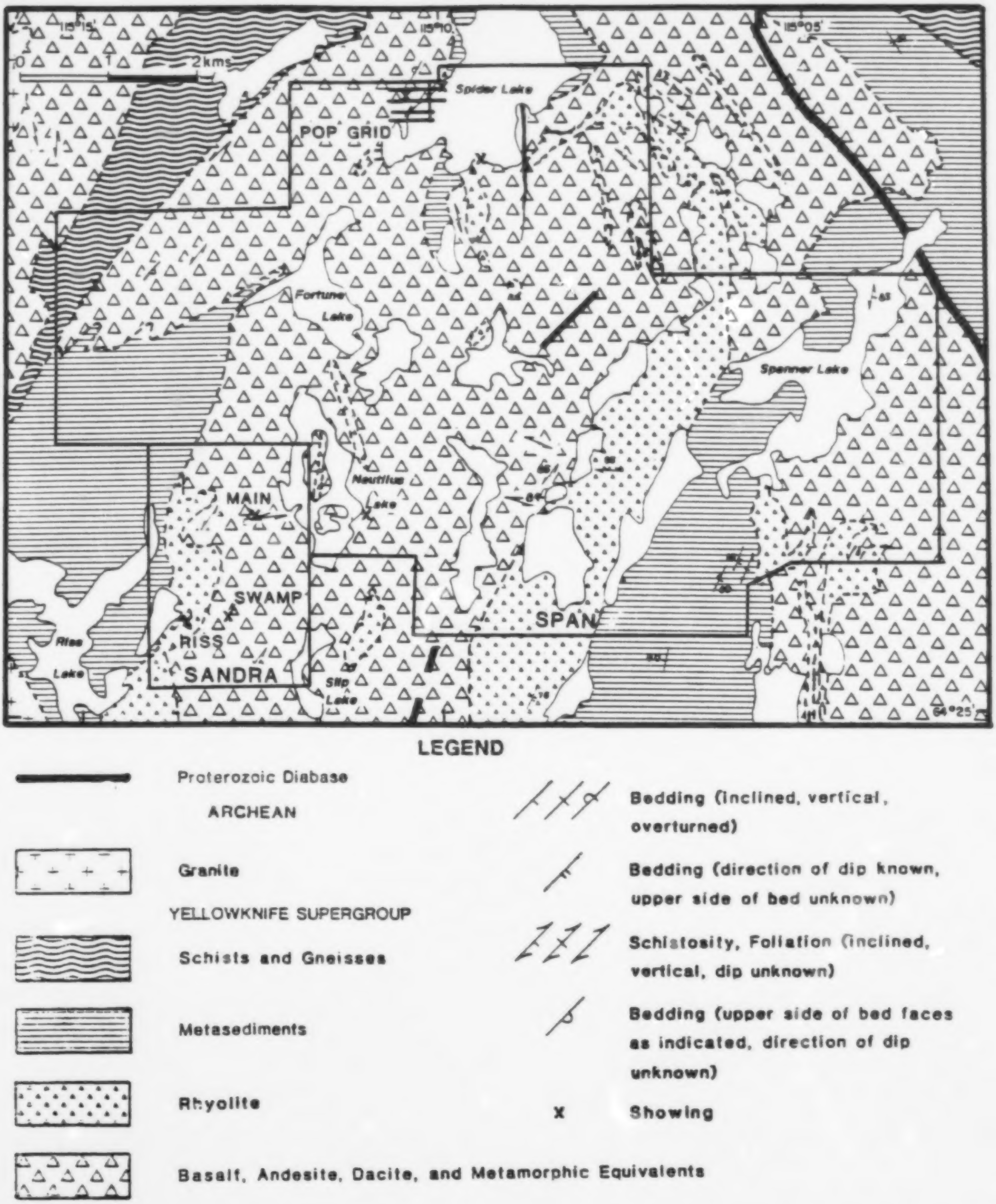

115°15'
115°10'
115°05'
0
2kms
Spider Lake
POP GRID
Fortune Lake
Spanner Lake
Nautilus Lake
MAIN
SWAMP
RISS
SANDRA
SPAN
Riss Lake
Slip Lake
64°25'
LEGEND
Proterozoic Diabase
ARCHEAN
Granite
YELLOWKNIFE SUPERGROUP
Schists and Gneisses
Metasediments
Rhyolite
Basalt, Andesite, Dacite, and Metamorphic Equivalents
Bedding (inclined, vertical, overturned)
Bedding (direction of dip known, upper side of bed unknown)
Schistosity, Foliation (inclined, vertical, dip unknown)
Bedding (upper side of bed faces as indicated, direction of dip unknown)
x
Showing

FIGURE 8-48: Geology and showings on the SPAN and SANDRA claims and the Pop grid.

LOCATION

The claim is east of Riss Lake, about 225 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

In 1945 Ingray Yellowknife Mines Limited acquired the RISS group at the east side of Riss Lake. Exploration work in 1945-46 by Trans-American Mining Corporation Ltd. found gold-bearing zones on which 762 m of drilling was completed.

In 1976 the ground was restaked as RISS 1-12 and FN 1-12 and trenching was done (DIAND assessment report 081886). SANDRA was recorded in April, 1983 and in August 1985 transferred to Frontier Gold Mines Ltd. In 1985 one day was spent examining and sampling the RISS showing (Fig. 8-48) which consists of quartz and carbonate veins in sheared calcareous andesite (DIAND assessment report 081886). In 1987 Echo Bay Mines explored the property.

DESCRIPTION

The eastern two thirds of the property is underlain by mafic massive and pillowed metavolcanics (Fig. 8-48) fringed to the west by a north-trending slice of felsic pyroclastics and overlain by metasediments (Fig. 8-48; Stanton *et al.*, 1954).

CURRENT WORK AND RESULTS

During prospecting and geologic mapping, 43 trenches in 3 groups were found and 16 samples were collected (Fig. 8-48):

1. The Swamp zone, a northeast-trending shear zone which can be traced for approximately 250 m, consists of a carbonate altered volcanic which hosts fine quartz stringers and veinlets and minor arsenopyrite, pyrite and chalcopyrite. A number of shear controlled quartz veins cross-cut this main shear zone. Seven trenches were cut hydraulically and from these 55 channel, 5 continuous chip and 11 grab samples were collected;
2. The Main zone, 183 m north of and parallel to the Swamp zone, is a series of quartz veins hosted within a northeast-trending shear zone cutting volcanic rocks. Two types of veins are within this zone. The first type is a discontinuous, folded, irregular set of white veins; the second is a more continuous set of shear-parallel smoky quartz veins. Sulphide development is weak and tends to be associated more with the smoky vein set. Both vein sets have anomalous gold assays associated with them. The zone was previously trenched over a strike length of 152 m;
3. Riss Lake showing is a 6 m long quartz pod hosted in metasediments.

GAN CLAIM

Rebus Oil Company
1842 - 14th St. SW
Calgary, Alta., T2T 3S9

Gold
86 B/6
64°25'N, 115°12'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment report: 082510.

PROPERTY

GAN

LOCATION

The GAN claim is just north of Turnpike Lake, 230 km north of Yellowknife (Fig. 8-44).

HISTORY

The claim was staked to cover an aeromagnetic high shown on GSC map 2931G and was recorded in August 1983.

DESCRIPTION

The claim area is underlain by andesite of the Yellowknife Supergroup (Figs. 8-43, 8-44; Stanton *et al.*, 1954).

CURRENT WORK AND RESULTS

In 1987 six days were spent cutting a 1.6 km east-trending line, along which magnetometer and VLF EM surveys were conducted and 10 rock and 21 soil samples were collected for gold, silver, copper, lead, zinc and arsenic assay (Fig. 8-49).

DY CLAIM

Aber Resources
700 - 1177 W. Hastings St.
Vancouver, B.C., V6E 2K3

Gold
86 B/6
64°24'N, 115°15'E

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment report: 082585.

PROPERTY

DY 1.

LOCATION

Property is between Schwerdt and Turnpike lakes, approximately 214 km north of Yellowknife (Figs. 8-43, 8-44).

HISTORY

No previous assessment work has been filed for this area; however, there are numerous trenches around Schwerdt Lake. The DY 1 claim was recorded in January 1985.

DESCRIPTION

Yellowknife Supergroup sediments and volcanics, cross-cut by north-trending Proterozoic diabase dykes, underlie the claim area (Fig. 8-49; Stanton *et al.*, 1954).

CURRENT WORK AND RESULTS

In 1987 the contact between the sediments and volcanics was prospected. Trenches around Schwerdt Lake were examined and eight samples of quartz-sulphide vein were collected for gold assay (Fig. 8-49).

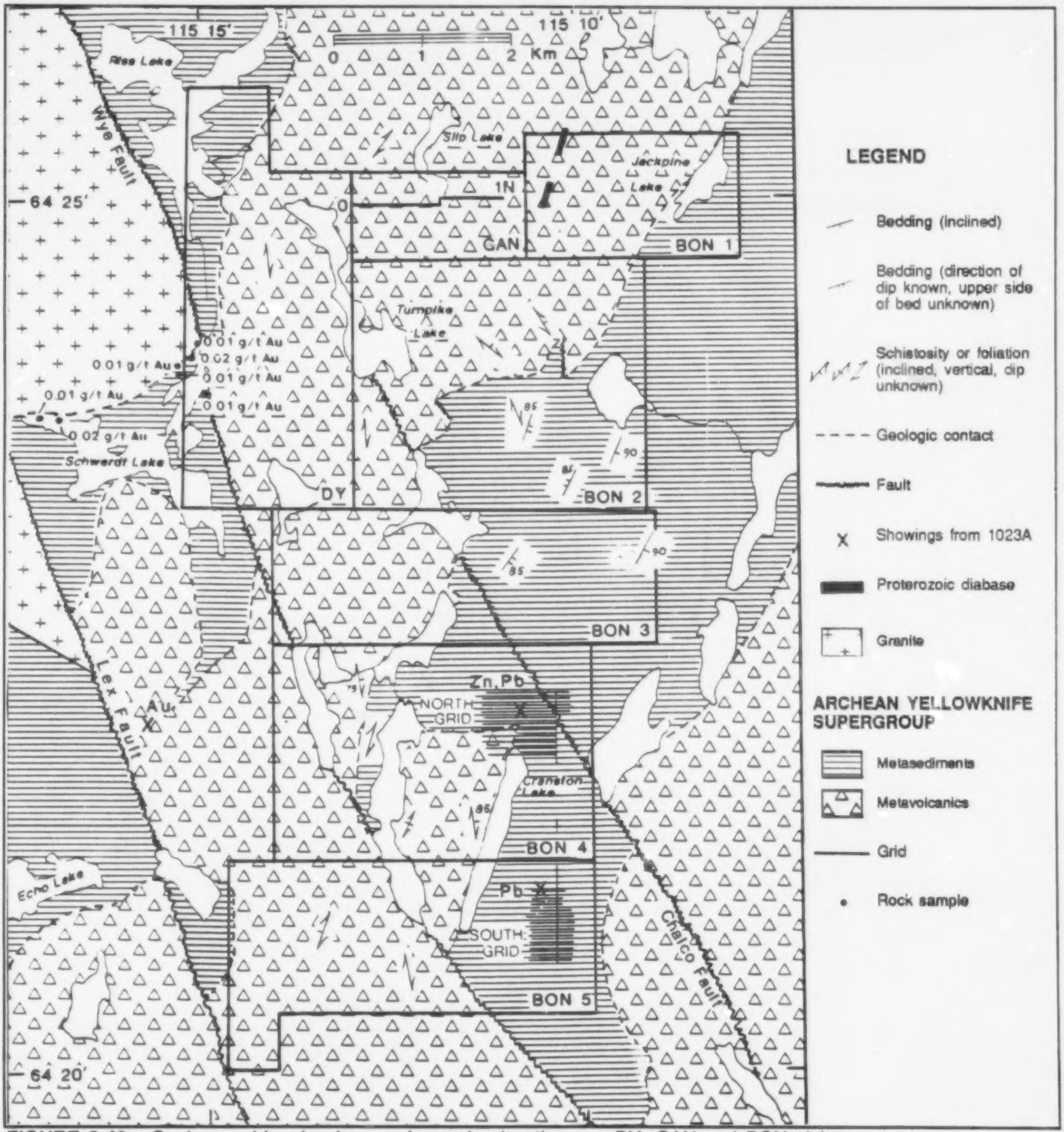

115 15'
115 10'
0 1 2 Km
Riss Lake
Wye Fault
Slip Lake
Jackpine Lake
1N
0
GAN
BON 1
64 25'
Turnpike Lake
0.01 g/t Au
0.02 g/t Au
0.01 g/t Au
0.01 g/t Au
0.01 g/t Au
0.01 g/t Au
0.02 g/t Au
Schwerdt Lake
85
90
85
DY
BON 2
85
90
BON 3
Zn,Pb
NORTH GRID
Au
Lex Fault
Cranston Lake
85
BON 4
Echo Lake
Pb
SOUTH GRID
Chalco Fault
BON 5
64 20'
LEGEND
Bedding (inclined)
Bedding (direction of dip known, upper side of bed unknown)
Schistosity or foliation (inclined, vertical, dip unknown)
Geologic contact
Fault
Showings from 1023A
Proterozoic diabase
Granite
ARCHEAN YELLOWKNIFE SUPERGROUP
Metasediments
Metavolcanics
Grid
Rock sample

FIGURE 8-49: Geology, grids, showings and samples locations on DY, GAN and BON claims.

BON CLAIMS

Cominco Ltd.	Gold
700 - 409 Granville St.	86 B/6
Vancouver, B.C., V6C 1T2	64°22'N, 115°12'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment report: 082056.

PROPERTY

BON 1-5 (3365 ha).

LOCATION

The property is near Indin Lake, approximately 200 km north of Yellowknife, immediately northwest of the KIM property (Figs. 8-43, 8-44).

HISTORY

Previous work indicated by trenches and drill core was not reported. The BON claims were staked for Cominco in June, 1984.

DESCRIPTION

The property covers a 9 km north-northwest-trending segment of the contact between dominantly mafic metavolcanics to the west and overlying metasediments to the east. The contact is displaced along several northwest-trending faults (Fig. 8-49). The metavolcanics comprise basalt, andesite and dacite. Minor rhyolitic flows, tuffs and agglomerates are present especially towards the top of the 1.0 to 1.5 km thick volcanic pile. Overlying metasediments comprise greywacke, slates, arkoses, quartzites and more highly metamorphosed equivalents. Volcanic and sedimentary units have been folded about north-trending axes and bedding is vertical.

CURRENT WORK AND RESULTS

In 1985, two cut grids, North and South (Fig. 8-49) were established to cover areas where there is evidence of earlier trenching and diamond drilling. Magnetometer and VLF EM surveys were completed over the grids. Two hundred and fifty-four B-horizon soil samples were collected, where possible, on the grids at 50 m intervals and analysed for gold and arsenic. The grids were geologically mapped at 1:4000. Exploration of the volcanic-sediment contact to the west and north of the gridded areas included collecting 320 soil samples which were assayed for gold and arsenic.

The North grid is underlain by massive andesite flows and felsic tuffs and greywacke. Some of the felsic volcanic rocks have been altered to sericite schists. Pyrite-rich graphitic beds, sometimes cut by narrow pyritic quartz veins, are interbedded with the greywacke. Fine-grained diabase dykes cut all units. A positive magnetometer anomaly on the North grid corresponds to a swampy zone with sparse outcrops of massive andesites and felsic tuffs. A broad area of low magnetic response in the northeast portion of the grid is underlain by greywacke. The VLF EM survey detected two northerly trending conductors that correspond to pyritic, graphitic units within the greywackes. No gold-arsenic soil geochemical anomalies were delineated on the North grid.

The South grid is underlain by greywackes and impure quartzites. The sediments are cross-cut by narrow quartz veins, which have been trenched. In the southeast portion of the grid where there is no outcrop, there is a moderate magnetic anomaly. Several north-northeasterly trending VLF EM conductors were outlined on the South grid. The most pronounced conductive zone is about 1 km long and corresponds to a topographic depression lacking outcrops. No gold-arsenic geochemical anomalies were delineated on the grid.

Anomalous (> 7 ppm) arsenic in soils was outlined by soil sampling at the south end of Cranston Lake (Fig. 8-49). Arsenic ranges from 10 to 447 ppm in a 1500 m by 400 m zone, and at Jackpine Lake (Fig. 8-49), arsenic ranges from 12 to 50 ppm in a 600 m by 800 m zone.

AGE, FRE, WEE, CAR, OPEN CLAIMS

D. Bryan	Gold
Sub. P.O. No. 1	86 B/6,3
Yellowknife, NWT, X1A 2N1	64°07'-64°28'N
	115°00'-115°12'W

REFERENCES

Frith (1986); Stanton *et al.* (1954); Tremblay *et al.* (1953). DIAND assessment report: 082561.

PROPERTY

AGE 1, 2; FRE 1, 2; CAR 1 and 3; OPEN 1; WEE 1-5.

LOCATION

The claims are in 5 blocks. CAR and OPEN are south of Indin Lake and AGE, FRE and WEE, north of Indin Lake (Figs. 8-43, 8-44), approximately 210 km north of Yellowknife.

HISTORY

The claims were staked in 1986.

DESCRIPTION

Claims are underlain by north-trending Archean Yellowknife Supergroup volcanics and are flanked by nodular schists and other metamorphosed sediments. Diabase dykes cross-cut the older rocks and trend northwest.

CURRENT WORK AND RESULTS

In 1987, 799 km of magnetometer and resistivity VLF EM survey was flown over 5 separate survey blocks (FRE, AGE, WEE, OPEN 1 and CAR 1). Line spacing was 150 m. (Fig. 8-50). Numerous bedrock conductors and anomalies with flanking or coincident magnetic anomalies were identified.

DAN Claim

J.I. Raines	Gold
Box 6596, Station D	86 B/3
Calgary, Alta., T2P 2E4	64°08'N, 115°11'W

REFERENCES

Frith (1986); Lord (1941); Tremblay *et al.* (1953).

DIAND assessment reports: 081933, 081934, 081935, 082424, 082642.

PROPERTY

DAN 1.

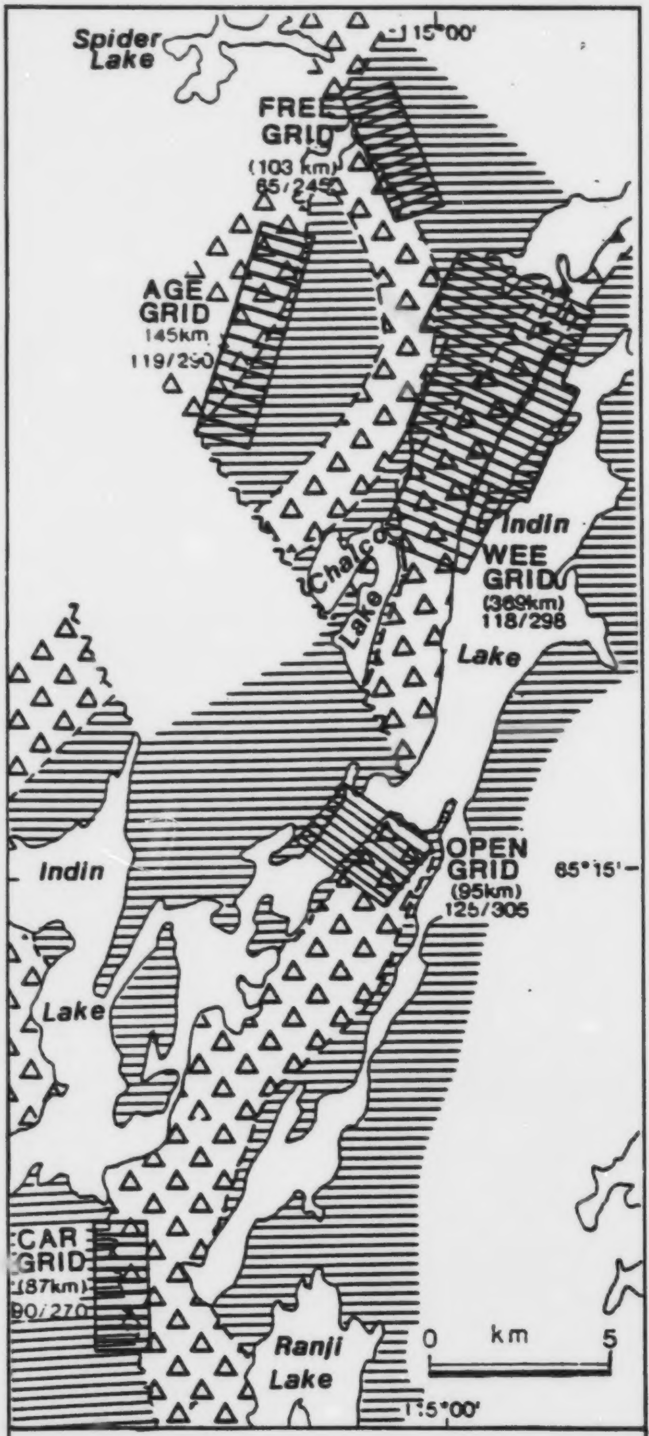

Spider Lake
115°00'
FREE GRID
(103 km)
65/245
AGE GRID
145km
119/290
Indin
WEE GRID
(369km)
118/298
Chalco Lake
Lake
Indin
Lake
OPEN GRID
(95km)
125/305
65°15'
CAR GRID
(87km)
90/270
Ranji Lake
0 km 5
115°00'
LEGEND
YELLOWKNIFE SUPERGROUP
Metasediments
Metavolcanics

FIGURE 8-50: Airborne geophysical survey areas for AGE, FRE, WEE, CAR and OPEN claims.

LOCATION

The claim is just west of Damoti Lake, 210 km north of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claim was staked in 1983. Previous work indicated by trenches and drilling on the northwest corner of the claim is not recorded in the assessment files. In 1985 exploration included sampling, geological mapping and a magnetometer survey (DIAND assessment report 081935).

DESCRIPTION

The claim is mainly underlain by hornblende schist, hornblende-feldspar gneiss and amphibolite derived from basalt and andesite of the Archean Yellowknife Supergroup. Several north-trending, steep-dipping felsic volcanic beds were mapped by Tremblay *et al.* (1953) in the north-central part of the claim, and the volcanics are cut by several north-trending diabase dykes. Lord's (1941) map has a gold showing in the mafic metavolcanics east of Gamey Lake in the west-central part of the property; however, additional information on this showing was not found.

CURRENT WORK AND RESULTS

In 1987 a structural geological study using Landsat digital MSS imagery and airphotos was completed to identify lineaments on the property.

ED, CDC and CHAL CLAIMS

Comaplex Resources	Gold
International Ltd.	86 B/06,07
901, 1015 4th St. SW	64°17'N, 115°03'W
Calgary, Alta., T2R 1J4	64°25'N, 115°03'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment reports: 082143, 082144, 082532.

PROPERTY

The contiguous ED 1 and CDC 1 claims (1250 ha) are co-owned by Greenstrike Gold Corporation. The CHAL 1-3 group (3130 ha), 7 km to the south, is co-owned by Petromet Resources Limited.

LOCATION

The CHAL group is west of Indin Lake and the ED and CDC claims are east of Baton Lake, about 190 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claims were recorded in December, 1984.

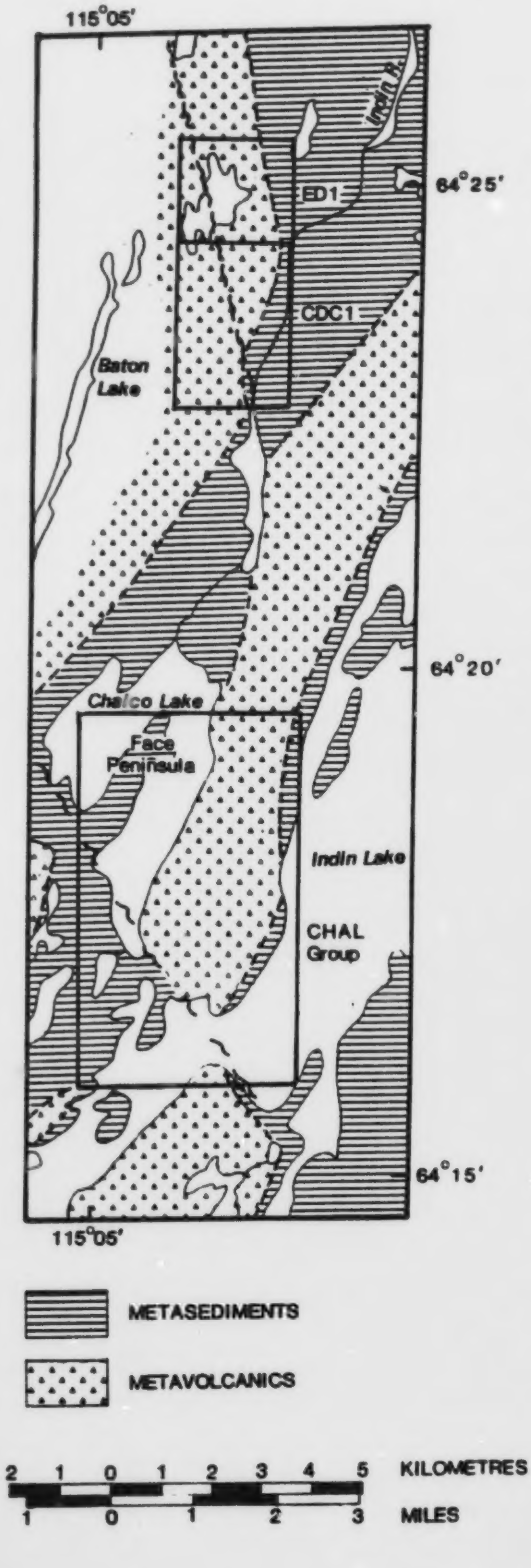


FIGURE 8-51: Geology of ED 1, CDC 1 and CHAL claims.

DESCRIPTION

The claims cover contacts between metavolcanics and metasediments of the Archean Yellowknife Supergroup (Fig. 8-51). Thin basaltic pillowed flows are the most common volcanic and are often carbonate and pyrrhotite rich. Thin units of hard, pink-weathering rhyolite are intercalated with the metabasalts on both claim groups, as are gabbroic sills. Rhyolite beds are also found in the metasediments. The metavolcanics and metasediments are generally north-northeast trending and steep dipping. Fold axes recognised in the metasediments, stretch lineation of pillows and elongation of pyrrhotite streaks all plunge steeply north. On the east margins of the claim groups granitic intrusions have metamorphosed sediments to biotite-hornblende schists and nodular gneisses. Late, northwest-trending sinistral faults and north-trending linear features across which no displacement is noted cross-cut all rock types.

CURRENT WORK AND RESULTS

1985 work is reported here because assessment reports were not filed prior to publication of the 1984-85 Mineral Industry Report. In 1985, a six-person crew spent 20 days mapping, prospecting and rock sampling. On the CHAL claims, a zone of silicification and sulfidisation was mapped along the east shore of Chalco Lake at the contact between metasediments and metabasalts. At the contact quartz veins and stringers carrying pyrite, chalcopyrite and sphalerite were sampled and assayed for gold and silver. Seven of 66 grab samples of sulphide-rich material contained >10 ppb (up to 1270 ppb) Au. On Face Peninsula (Fig. 8-51), sulphide-rich margins were identified along the contacts of a thin rhyolite bed in metasediments. The sulphide margins, up to 3 m thick, comprise pyrite, graphite and minor chalcopyrite, galena and chert. Fifteen of 36 rock chip samples of sulphide-rich material contained >10 ppb Au; the maximum assay was 92 ppb Au.

CDC 1 was mapped and prospected; 79 samples were collected for gold and silver assay. Pyrrhotite-bearing basalt flows are in contact with greywacke along the west side of Indin River. Finely disseminated, euhedral arsenopyrite is associated with pods of blue-grey mottled quartz, quartz-carbonate stringers and vein breccia in the basalt. Gold content ranged up to 3160 ppb.

KIM PROPERTY

Echo Bay Mines Ltd.	Gold
354 Granville Sq.	86 B/6
200 Granville St.	64°18'N, 115°17'W
Vancouver, B.C., V6C 1S4	

REFERENCES

Frith (1986); Lord (1951); Morgan (1988); Seaton *et al.* (1985); Stanton *et al.* (1954).

DIAND assessment reports: 081586, 081698, 081836, 081898, 082061, 082076, 082083, 082100, 082109, 082531.

PROPERTY

Exploration of KIM 1-13 and BAN 1 is a joint venture among Echo Bay Mines Ltd., as operator, Comaplex Resources International Ltd. and Petromet Resources Ltd. BAN 1 was returned to its owner, J. Raines in 1987.

LOCATION

The claim group is centred on Lex Lake, 212 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The early history of staking in the property area is given by Seaton *et al.* (1985). Much of the 1940's work done on the claims was by Lexindin Gold Mines Ltd. (Lord, 1951) and included drilling the A and C zone showings on Lex Lake.

In 1981 Comaplex Resources International Ltd. recorded KIM 1-9 and sampled existing trenches on KIM 1, 4-6 and 8. Encouraging results were obtained from the A zone on the peninsula on the east side of Lex Lake on KIM 5 (Seaton *et al.*, 1985; DIAND assessment report 081586). In 1982, Petromet Resources Ltd. entered into a joint venture with Comaplex to develop the properties. During winter 1983 magnetometer, VLF EM and Max Min HLEM surveys were conducted over Lex Lake to identify strike extension of the A zone (Seaton *et al.*, 1985; DIAND assessment report 081698).

In 1984, Echo Bay Mines Ltd. joined the Comaplex/Petromet joint venture and drilled four holes totalling 304.2 m along the west shore of Lex Lake in KIM 5 to test an EM conductor and thus discovered the Main zone (DIAND assessment report 081836). As a result, in late 1984, six claims (KIM 1-3, KIM 6-8) were staked and BAN 1, recorded in 1983, was optioned from J. Raines. Prospecting of the new claims found the Cass gold zone in fall 1985, 3 km southwest of Lex Lake. The KIM 9-13 claims were subsequently staked. By the end of 1985, Echo Bay had earned a 75% undivided interest in the claims while Comaplex returned 18.75% and Petromet 6.25%.

DESCRIPTION

The KIM and BAN 1 claims are underlain by Yellowknife Supergroup metavolcanics and metasediments (Fig. 8-52). The metavolcanics form a northeast-trending homoclinal sequence of dominantly pillowed basaltic, andesitic and dacitic flows, intercalated pyroclastics of variable composition, and subvolcanic intrusions. Primary structures such as pillow selvages, vesicules and graded bedding in pyroclastics are preserved. Sedimentary rocks consist of turbiditic greywacke and argillite. Beds vary in thickness from 2 cm to greater than 1 m and primary sedimentary structures are preserved.

Metamorphism ranges from lower greenschist to amphibolite facies within both sedimentary and volcanic rocks. Both the Main zone and Cass zone are in amphibolite-grade volcanic rocks.

The area is structurally complex. Sedimentary rocks are isoclinally folded. Broader folding is recognised within the volcanics. Northwest-trending left-lateral strike-slip faults with near vertical dips, such as the Inca and Lex faults, are the latest and predominant fault direction in the area. These northwest-trending faults are seen displacing an earlier set of north-trending faults such as the Leta fault, which are also believed to have left lateral displacements (Fig. 8-52).

The Main zone on Lex Lake is a stratiform deposit, consisting of quartz-carbonate veins in fractured, sulphide-rich, silicified massive basalt flows, the upper and lower massive basalts, and is 60 m from the volcanic-sedimentary contact. The Main zone has a north trend and dips steeply west. It has been traced for 730 m along strike on the west shore of Lex Lake extending southward where is it displaced 183 m east along the west-northwest Crooked Lake fault. Detailed mapping by Echo Bay Mines has identified the following stratigraphy: a basal sequence of pillowed and massive basalts and irregular gabbroic bodies overlain by: the lower massive basalt; the lower amygdaloidal pillow unit characterised by carbonate amygdules; the upper massive basalt; and the upper amygdaloidal pillow unit characterised by quartz-feldspar amygdules. The volcanic package has been metamorphosed to amphibolite facies, but is in fault contact with a lower greenschist facies package of turbidites. This vertical ductile fault represents a major structural break between the two metamorphic grades. This stratigraphic package can be traced for approximately 900 m with the host basalt units averaging 15 to 20 m in width.

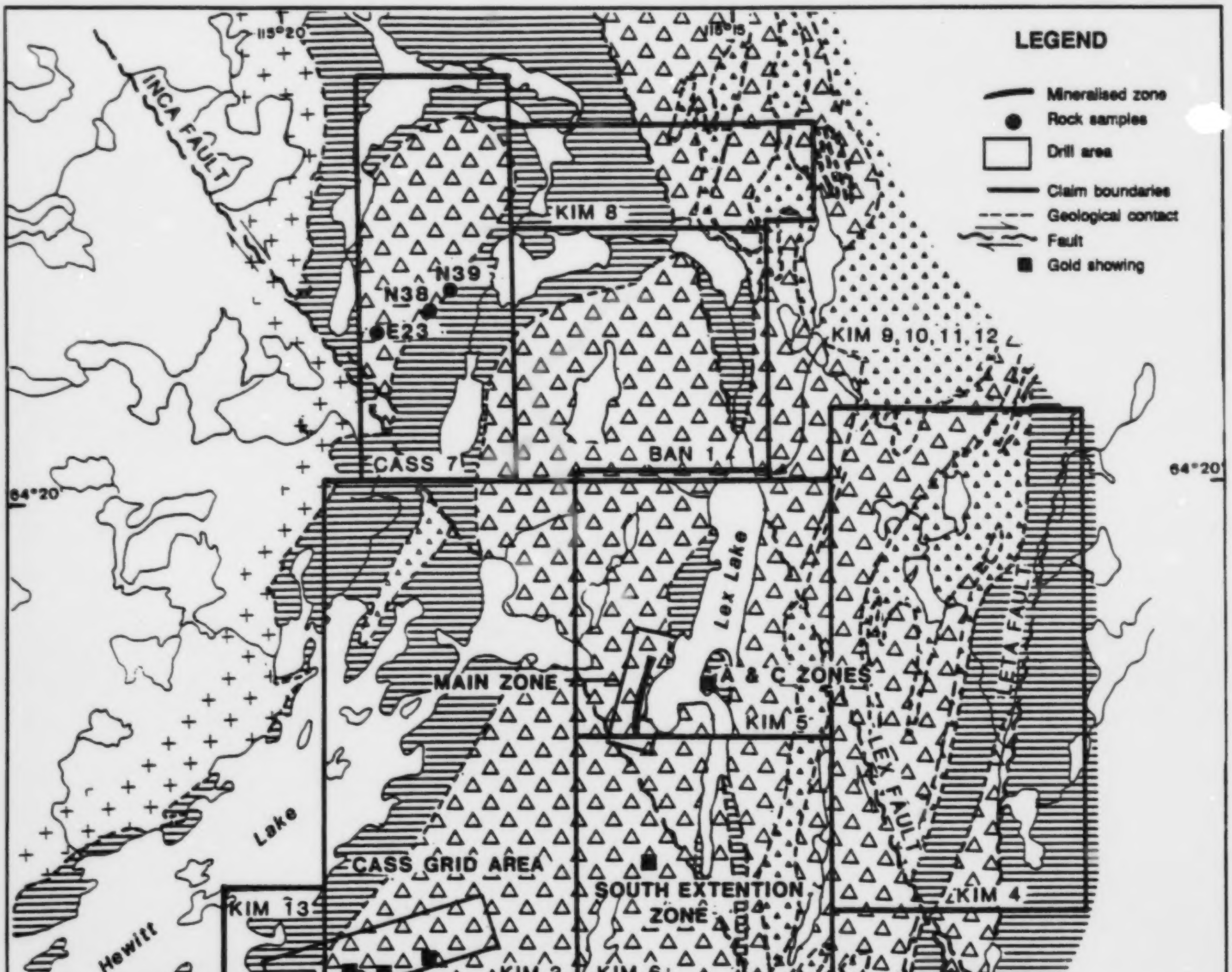
Smoky to white quartz-carbonate vein sets in the Main zone trend northwest and northeast. Veins are folded and show strong ribbon textures along their contacts. Elongate pyrrhotite crystals are oriented along a prominent foliation common in basaltic rocks of the Main zone. Massive and euhedral arsenopyrite is found within and adjacent to quartz-carbonate veins, and in haloes extending 20 to 30 cm from the veins. The arsenopyrite overprints and possibly replaces pyrrhotite grains, and is commonly deformed. Free gold, sometimes visible, is in quartz-carbonate veins, in fractures cutting arsenopyrite crystals, and in sulphide-rich haloes adjacent to veins.

In the Cass zone, 3 km southwest of the Main zone, gold is hosted within a northeast-trending, subvolcanic gabbroic sill, the Cass gabbro, which intrudes a sequence of intermediate to felsic flows and pyroclastics. The gabbro varies in width from 20 to 100 m and has a strike length of approximately 2 km. Two sets of quartz-carbonate veins localise gold, pyrrhotite and arsenopyrite within the host unit. A northwest-trending set of smoky-white, mottled quartz-carbonate veins is dominant. These veins range from a few centimetres to several meters in length and are up to 40 cm in width. Veins are at a high angle to both gabbro contacts and foliation, and are structurally complex. Vein margins are ribboned and the interior structure of the veins is highlighted by folded layers of quartz within recrystallized carbonate. Folds are open to tight, have steep, plunging axes, and axial surfaces are subparallel to the local foliation. The less abundant, northeast-trending vein set is composed of smoky-white quartz, and in contrast with the northwest vein set, is carbonate poor, lies at low angles to the foliation and lacks internal structure.

Pyrrhotite, the dominant sulphide, forms elongated crystals parallel to foliation in haloes 30 to 50 cm in width adjacent to both vein sets. It is also found in massive accumulations along vein contacts. Arsenopyrite occurs in diffuse zones as coarse-grained euhedral crystals adjacent to veins in the silicified metagabbro and as anhedral crystal masses within the veins and along vein contacts. Minor pyrite and chalcopyrite are also present. Gold is concentrated along the contacts of the quartz-carbonate veins, but the sulphide-rich silicified gabbro unit also contains anomalous concentrations of gold.

CURRENT WORK AND RESULTS

In 1986 work included 1:10 000 scale mapping of the property, 1:2500 scale mapping of KIM 5-6 and BAN 1, 1:500 scale mapping of the Main zone and Cass grid, structural studies of the Cass zone, prospecting, rock and soil sampling and geophysical surveys (DIAND assessment reports: 081898,



LEGEND
Mineralised zone
Rock samples
Drill area
Claim boundaries
Geological contact
Fault
Gold showing
GEOLOGICAL UNITS
Granodiorite, Quartz-diorite, Granite
YELLOWKNIFE SUPERGROUP
Greywacke, Argillite, Slate & Metamorphosed Equivalents
Quartz-feldspar Rhyolite & Dacite
Basalt, Andesite, Dacite & Metamorphosed Equivalents
1 0 1 2
KILOMETRES
115°20'
115°15'
64°20'
64°20'
64°15'
INCA FAULT
KIM 8
N39
N38
E23
KIM 9, 10, 11, 12
CASS 7
BAN 1
Lex Lake
MAIN ZONE
A & C ZONES
KIM 5
LETA FAULT
LEX FAULT
Hewitt Lake
CASS GRID AREA
SOUTH EXTENTION ZONE
KIM 4
KIM 13
KIM 3
KIM 6
INCA FAULT
ALBATROSS ZONE
CASS ZONE
19th HOLE ZONE
Indin Lake
KIM 1
KIM 2
KIM 7

FIGURE 8-52: Geology, grid areas and gold mineralised zones on the KIM claims, CASS 7 claim and BAN 1 claim.

082061, 082076, 082083, 082100). The Albatross and 19th drill hole areas were identified (Fig. 8-52). In 1986-87 Echo Bay completed three drill programs. The first totalling 1941 m in four deep holes on the Main zone (DIAND assessment report 082061) confirmed its extension to a vertical depth of 360 m with grades averaging 7.2 ppm Au across an average width of 4.5 m. The second program of 28 holes totalling 3080 m on the Cass zone confirmed a strike of 360 m (DIAND assessment report 082109). Visible gold was observed in core from 21 of these holes. The width of the Cass zone was found to range from 1 to 15 m, with an average width of 4.9 m.

Exploration continued during November 1986 to March 1987 with the third drill program when 7674 m of NQ core in 44 holes was drilled. Of this total, 241 m were drilled in two holes on the Main zone to determine the attitude of mineralised shoots, three holes on the Albatross, two holes on the 19th drill hole and the remainder in the Cass.

Total drilling to date on the KIM claims is 24 361.7 m; divided between the Main zone and south extension areas, 13 849.7 m; and the Cass and adjacent areas, 10 512 m (Fig. 8-52). Drilling outlined the Main zone over a strike length of 730 m. Faulting has divided the zone into 6 discrete blocks. Probable geologic reserve estimate for one block in an upper central part of the Main zone, 271 m long by 95 m deep, is 112 566 t of 7.98 g/t Au, using a cut-off grade of 4.00 g/t Au and a minimum width of 1.5 m. The Cass has been intersected by drilling over a strike length of 300 m to a vertical depth of 210 m and is open on the southwest half. A probable geologic reserve estimate on a 120 m long by 210 m deep block is 336 292 t grading 7.17 g/t Au. A 3 t bulk surface sample was collected from each of the Main and Cass zones for metallurgical testing and conductivity sorting tests.

FUR CLAIMS

Aber Resources Ltd.	Gold
700, 1177 W. Hastings St.	86 B/6
Vancouver, B.C., V6E 2K3	64°18'N, 115°09'W

REFERENCES

Lord (1951); Stanton *et al.* (1954); Frith (1986).
DIAND assessment reports: 082041, 082586.

PROPERTY

FUR 1 and 2.

LOCATION

The claims are north of Float Lake about 210 km north of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claim area was staked previously as the ROLEX group by Bidd Consolidated Mines Ltd. in the late 1940s. A 24 m circular mass of white, glassy quartz within Yellowknife Supergroup greywackes and argillites was explored by drilling and excavation of 39 trenches (Lord, 1951).

DESCRIPTION

The claims are entirely underlain by north-trending, tightly folded, interbedded greywacke and argillite cross-cut by Proterozoic diabase dykes (Stanton *et al.*, 1954). North-trending, near vertical shear zones containing auriferous quartz-feldspar-sulphide veins were found between Pistol and Knob lakes on FUR 1.

CURRENT WORK AND RESULTS

In 1987 the shear zones were geologically mapped at 1:1000 along a 3 line-km grid (Fig. 8-53). Nine samples were collected for assay and VLF, magnetometer and gradiometer surveys were completed.

MAR, JOE, MAT CLAIMS

E.P. Meyers	Gold
139 Coleridge Rd. NW	86 B/3,6
Calgary, Alta., T2K 1X5	64°15'N, 115°08'W
	64°12'N, 115°09'W

REFERENCES

Frith (1986); Tremblay *et al.* (1953).
DIAND assessment reports: 060412, 060858, 082119.

PROPERTY

MAR, JOE, MAT.

LOCATION

MAR and JOE are staked over a narrows in Indin Lake and MAT on the north shore of Indin Lake, approximately 210 km north of Yellowknife (Figs. 8-43, 8-44).

HISTORY

In 1970 Seigel & Associates flew an EM and magnetic survey on behalf of Freeport Oil Company Ltd. in search of base metal massive sulphide deposits over the area including the MAR, JOE and MAT claims (DIAND assessment report 060412). This was followed by staking and drilling including 2 holes in the JOE claim (previously the VAN claims, DIAND assessment report 060858; Fig. 8-53). In 1984, E.P. Meyers staked the MAR, JOE and MAT claims.

DESCRIPTION

Mafic through felsic flows are flanked by metasediments including schists and greywacke. Typically at the metavolcanic-metasedimentary contact there are graphitic horizons with disseminated pyrite, pyrrhotite and chalcopyrite.

CURRENT WORK AND RESULTS

1984 and 1985 work is reported here because assessment files were not submitted prior to publication of previous Mineral Industry Reports. In 1984, each claim block was explored by two lines of magnetometer and VLF EM survey. Prospecting included collection of 13 samples for gold assay (Fig. 8-53). In 1985, on the MAR claim, geologic mapping and magnetometer survey were completed over a 425 m by 240 m grid, with 60 m line space and stations every 30 m. Thirty-five samples were collected; assays ranged from trace to 2.8 g/t Au.

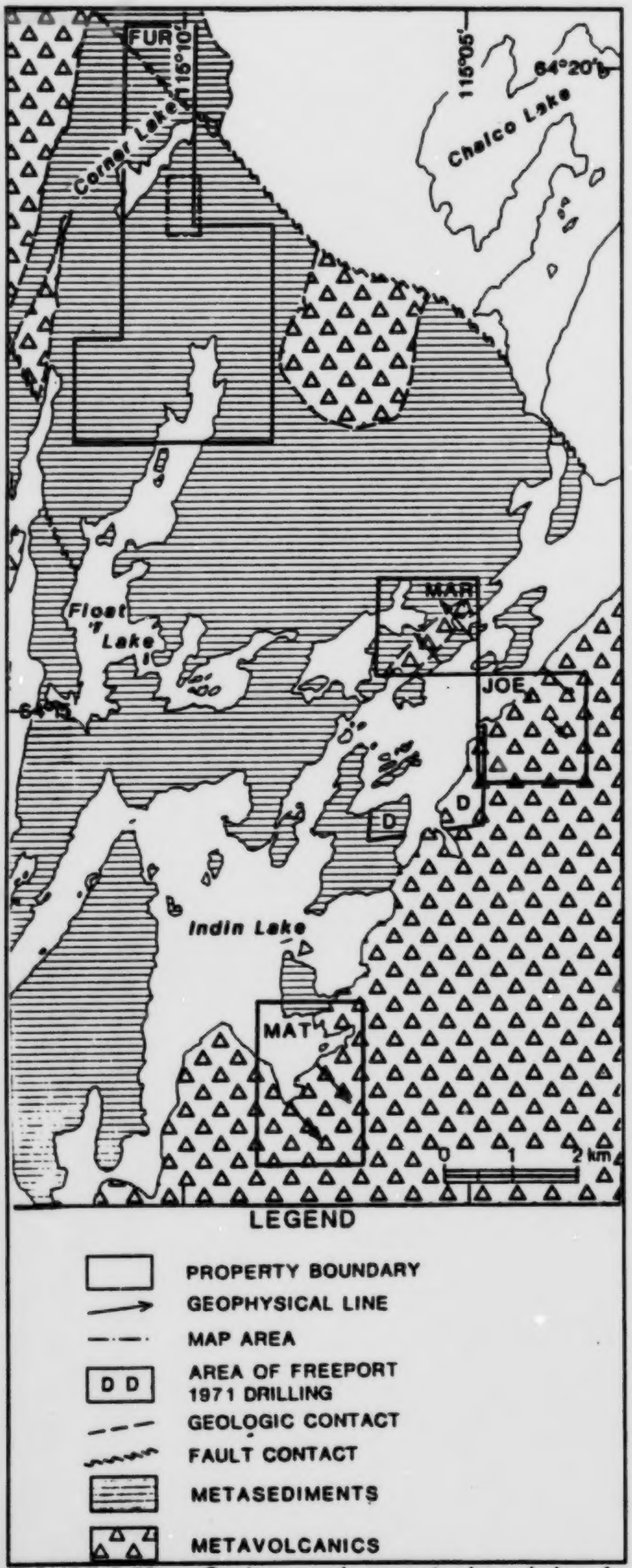

FUR
115°10'
115°05'
64°20'
Chalco Lake
Corner Lake
Float Lake
64°15'
MAR
JOE
D
D
Indin Lake
MAT
0
1
2 km
LEGEND
PROPERTY BOUNDARY
GEOPHYSICAL LINE
MAP AREA
D D
AREA OF FREEPORT 1971 DRILLING
GEOLOGIC CONTACT
FAULT CONTACT
METASEDIMENTS
METAVOLCANICS

FIGURE 8-53: Geology and property boundaries for FUR, MAR, JOE and MAT claims.

INGOT CLAIM

Mountain Lake Mines Ltd.	Gold
22 Lake Christina Close SE	86 B/03
Calgary, Alta., T2J 2R9	64°14'45"N, 115°12'W

REFERENCES

Frith (1986); Lord (1942), Tremblay *et al.* (1953).
DIAND assessment report: 082178.

PROPERTY

INGOT 1 (69 ha).

LOCATION

The claim is at Indin Lake, about 190 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

INGOT 1 was recorded in March, 1985.

DESCRIPTION

The property covers part of the north-trending contact beneath Indin Lake between Archean Yellowknife Supergroup metabasalts to the west and metasediments to the east (Fig. 8-43).

CURRENT WORK AND RESULTS

In 1986, four chlorite-carbonate-sericite schist samples and one smoky blue-grey quartz sample from a 1 m by 10 cm vein were collected at the northwest corner of the claim. Assay results were 2 ppb Au in the schist samples and 14 ppb Au in the quartz.

NAM and RUST CLAIMS

Stratabound Minerals Corp.	Gold
Suite 518, 222, 58 Ave. SW	86 B/3,5,6; 85 O/13
Calgary, Alta., T2H 2S3	64°09'N, 115°20'W
	64°07'N, 115°23'W
	64°15'N, 115°30'W
	63°55'N, 115°40'W

REFERENCES

Frith (1986); Lord (1942); Tremblay *et al.* (1953).
DIAND assessment reports: 019682, 082514.

PROPERTY

NAM 1-3; RUST 1-3.

LOCATION

These claims are in four separate blocks: NAM 1, NAM 2, NAM 3 and RUST 1-3, 110 to 210 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The RUST claims cover the area formerly held as the BY and BEAR claims, which were staked to cover airborne EM anomalies identified by Great Plains Development Co.'s 1971 input survey in search of volcanogenic base metals. Follow-up geological and geophysical work in 1972 identified graphitic zones weakly mineralised with pyrrhotite and pyrite (DIAND assessment report 019682).

In 1984 Wollex Exploration prospected and sampled part of the claim area, mapped, completed VLF EM and magnetometer surveys and trenched anomaly 45 from the 1971 input survey, which is on RUST 2. One sample from a zone of disseminated sulphides in felsic tuffs near the volcanic-sediment contact assayed 11.04 g/t Au. The NAM 1-3 and RUST 1 claims were staked in 1985 and RUST 2 and 3 in 1986 by Stratabound in response to interest provided by the announcement of discoveries on Echo Bay's KIM property.

DESCRIPTION

NAM 3 is at the western termination of an easterly trending volcanic belt that swings to the north in the vicinity of the Cass and Lex Lake gold properties. NAM 1-2 and RUST claims are along a northeasterly trending volcanic belt that forms the west limb of the Spider Lake synclinorium (Frith, 1986). Basalts are the most abundant volcanic rocks and consist of pillowed and massive flows, fragmentals and metagabbro, which, with the increasing effects of deformation and metamorphism, grade into garnet-amphibolite schists and gneisses. Minor felsic volcanics comprise massive and fragmental rhyolite and dacite and typically are at or near the contact with sedimentary rocks, but are also intercalated with basalts.

Greywacke is the most abundant sedimentary rock and consists of nodular schist containing porphyroblasts of cordierite, andalusite, staurolite, garnet or sillimanite. Argillaceous rocks are near the contact with the volcanics and are graphitic, sheared and locally contain pyrite and pyrrhotite. There are numerous gossans up to 60 m long at the volcanic-sediment contact.

Granite and pegmatite sills and dykes have intruded the supracrustal sequence covered by the NAM 3 claim. Diabase dykes cut all rock types and are on all the claims.

CURRENT WORK AND RESULTS

In 1986, prospecting, geological mapping and collection of 374 samples for assay were completed. Forty samples had anomalous gold assays (>10 ppb). In 1987, prospecting, mapping, line cutting, trenching, chip sampling and saw cut channel sampling were completed. Anomalous gold assays were returned for samples from:

1. gossans in the sediments, particularly those associated with pyritic, graphitic argillite or shale,
2. gossans associated with volcanic-sedimentary contacts, and
3. the Hillside showing on NAM 3, where a branching series of quartz- and pyrite-bearing veins and lenses cut banded and sheared mafic volcanics. The main vein is 1 to 2 m wide and traceable for 50 m. The best assay was 5950 ppb Au.

SHILL and TANQ CLAIMS

Tanqueray Resources Ltd.
100, 625 4th Ave. SW
Calgary, Alta.

Gold, Base Metals
85 O/13,14; 86 B/3,4
64°00'N, 115°30'W

REFERENCES

Lord (1942); McGlynn (1963); Smith (1963).
DIAND assessment report: 082564.

PROPERTY

SHILL 1-2 and TANQ 1-2 (3117 ha).

LOCATION

The claims are 200 km northwest of Yellowknife (Figs. 8-43, 8-45).

HISTORY

The claims were staked in January 1985 and transferred to Tanqueray Resources in 1987.

DESCRIPTION

Claims cover the southern extension of Indin Lake metavolcanics, foliated, layered amphibolite schists, enveloped by overlaying metasediments, schists and paragneiss.

CURRENT WORK AND RESULTS

Between November 7-10, 1987 a 275 km heliborne Dighem III electromagnetic/resistivity/magnetic/VLF EM survey over two overlapping grids identified numerous geophysical anomalies.

CASS and DAVE CLAIMS

Following Echo Bay's discovery of stratiform gold on the KIM claims in 1984, Taiga Consultants Ltd. had several claim groups staked, including CASS 7-9 and DAVE 3-9, to cover favourable stratigraphy along the volcanic-sediment contact in the Indin area. These properties were optioned and follow-up work during 1986-87 on CASS 7, CASS 9, DAVE 6 & 7, and DAVE 8 & 9 consisted of heliborne geophysics, and on CASS 8 and DAVE 3-5, geologic mapping and prospecting.

CASS 7 CLAIM

Manson Creek Resources Ltd.
410, 1122 4th St. SW
Calgary, Alta., T2R 1M1

Gold
86 B/06
64°22'N, 115°19'W

REFERENCES

Frith (1986); Stanton *et al.* (1954).
DIAND assessment report: 082132.

PROPERTY

CASS 7 (502 ha).

LOCATION

The property is adjacent to and northwest of the KIM claims, 200 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claim was staked in December, 1984.

DESCRIPTION

The property is underlain by Archean supracrustal rocks of the Yellowknife Supergroup (Stanton *et al.*, 1954), including agglomerates, turbidites and metabasalts forming a steeply dipping, north-northeasterly trending succession flanked by a granitic pluton to the west of the property. The supracrustals are cut by northwest-trending gabbroic Proterozoic dykes and faults.

CURRENT WORK AND RESULTS

In 1985, 40 line-km of VLF EM and magnetometer survey were flown by Dighem Ltd. on CASS 7. Conductors coincide approximately with the contact between metavolcanics and metasediments, and the contact zone is more magnetic than the adjacent formations.

In 1986, a two-person crew geologically mapped and collected 56 samples from quartz veins and gossanous zones in all rock types for gold and silver assay. Three samples were anomalous: a rusty, quartz-veined gabbro dyke assayed 102 ppb Au; a gossanous basalt, cross-cut by quartz veins containing visible gold, flanking a granite sill assayed 584 ppb Au; and a tourmaline-rich quartz vein near the basalt-sediment contact assayed 1760 ppb Au.

CASS 8 CLAIM

Terra Mines Limited
P.O. Box 37
Winterburn, Alta., T0E 2N0

Gold
86 B/3
64°04'N, 115°26'W

REFERENCES

Frith (1986); Tremblay *et al.* (1953).
DIAND assessment report: 082307.

PROPERTY

CASS 8.

LOCATION

The claim is about 16 km southwest of Indin Lake, 195 km northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claim was staked in late 1984.

DESCRIPTION

Metavolcanic rocks, now mainly foliated, layered, recrystallised amphibole-rich schists with lesser felsic tuffs and agglomerates, form a north-trending belt 1.5 to 2.5 km wide. To the east of this belt is porphyroblastic feldspar-quartz-biotite schist and paragneiss and to the west, equigranular paragneiss. Numerous pegmatitic dykes associated with a large granite pluton to the west cross-cut the rocks. Diabase dykes cross-cut all rock types. Contacts between metasediments and the resistant metavolcanics are marked by escarpments. Close to the contacts with metasediments, the volcanics are silicified and contain pyrite and pyrrhotite with minor chalcopyrite forming numerous gossans. Locally, over a strike length of 3000 m along the eastern contact, there is a hard, dense, magnetic exhalite with abundant pyrite and pyrrhotite which has been trenched. This contact is in part sheared and is interpreted as a thrust.

CURRENT WORK AND RESULTS

The claim was mapped and prospected. Selected areas, including trenches and gossanous zones were mapped and prospected in detail.

CASS 9 and DAVE 8, 9 CLAIMS

Delaware Resources Corp.
100, 1300 - 8th St. SW
Calgary, Alta., T2R 1B2

Gold
86 B/3; 85 O/13,14
64°05'N, 115°23'W;
63°54'N, 115°28'W

REFERENCES

Frith (1986); Tremblay *et al.* (1953).
DIAND assessment reports: 082147, 082148.

PROPERTY

CASS 9 and DAVE 8, 9.

LOCATION

CASS 9 is northwest of Snare River at 64°05'N, 115°23'W and DAVE 8 and 9 are south of Snare River at 63°54'N, 115°28'W, 200 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claims were staked in 1984. In 1985, 141 line-km of VLF EM and magnetometer survey was flown by Dighem Ltd. over the two claim blocks with a 200 m line spacing.

DESCRIPTION

The claims are underlain by mafic and felsic metavolcanics and overlying metasediments comprising nodular, garnet-bearing quartz-biotite schist, cordierite schist, quartz-biotite gneiss and carbonaceous schist. A band of acidic to cherty volcanics locally marks the volcanic-sedimentary contact. Northwest-trending Proterozoic diabase dykes cut all other rock types (Frith, 1986; Tremblay *et al.*, 1953). An east-northeast-trending topographic lineament within the mafic volcanics may represent a major shear zone coincident with a synclinal fold axis.

CURRENT WORK AND RESULTS

During September-October, 1986, 12 anomalous areas defined by the Dighem airborne survey were mapped and sampled on DAVE 8 and 9. Most were found to correspond with mafic-felsic volcanic and volcanic-sediment contact zones that display evidence of shearing. Within these zones there are disseminated to massive pyrite with lesser amounts of chalcopyrite. The east-northeast-trending shear zone in the mafic volcanics is also expressed as a geophysical anomaly that is associated with the presence of sulfides. Twelve grab samples returned gold assays ranging from trace to 0.14 g/t Au.

DAVE 3-5 CLAIMS

Terra Mines Ltd.	Gold
Suite 202, 7608 - 103rd St.	85 O/14
Edmonton, Alta., T6E 4Z8	63°57'N, 115°10'W

REFERENCES

Frith (1986); Lord (1942); Wright (1954).
DIAND assessment reports: 082306, 082308.

PROPERTY

DAVE 3-5.

LOCATION

The claims are between 160 and 176 km northwest of Yellowknife. DAVE 4 is on the southeast shore of Wijinnedi Lake and DAVE 3 and 5 are about 29 km southwest of Indin Lake (Figs. 8-43, 8-44).

HISTORY

Terra Mines Ltd. acquired the DAVE claims from Taiga Consultants in the summer of 1986. Work on DAVE 4 was conducted as a joint venture agreement between Terra Mines Ltd. and Dynagold Resources Ltd.

DESCRIPTION

Archean sedimentary and volcanic rocks, metamorphosed to medium and high grades, underlie the claims (Lord, 1942; Wright, 1953; Frith, 1986). Volcanic rocks on DAVE 4 are mainly intermediate to mafic, garnet amphibolite schists and pillowed flows, with minor intercalated rhyolite and sedimentary rocks. Felsic, intermediate and mafic fragmental volcanic units are abundant on DAVE 3 and 5, with lesser amounts of rhyolite and pillowed and massive mafic-intermediate flows. A bright green micaceous mineral, possibly mariposite or talc was found sporadically throughout DAVE 3 and 5 in contorted tuffaceous rocks associated with quartz veins. Cordierite-andalusite schists and paragneiss represent a metamorphosed greywacke-argillite sequence. Locally, volcanic-sediment contacts are marked by gossans and limestone-dolomite.

The more competent volcanic lithologies may form a homoclinal sequence, whereas both the sedimentary rocks and fragmental volcanic units are isoclinally folded about east- or northeast-trending axes. Small scale, north-plunging folds are also documented. Some topographic lineaments represent shear zones. Gossans are noted in sheared felsic and mafic volcanic rocks along some of these zones.

CURRENT WORK AND RESULTS

Geological mapping, prospecting and sampling of the claims was carried out between July and September 1986. Prospecting targets included the sediment-volcanic contact, gossans in both sedimentary and volcanic rocks, linear fractures and quartz veins or lenses.

A gossan along the volcanic-sediment contact on DAVE 4 marks a zone of black exhalite and graphitic schist containing erratic stringers, veinlets and disseminations of pyrite and minor pyrrhotite. Two samples from this contact zone assayed 0.041 g/t Au. Rusty zones along the sediment-volcanic contact on DAVE 3 and 5 contain pyrite, pyrrhotite and minor chalcopyrite.

A quartz vein in rusty sedimentary rocks on the DAVE 4 property, 122 m long and 0.15 to 0.37 m wide assayed trace gold, with one sample assaying 0.17 g/t Au. On DAVE 3 and 5, veins of quartz, calcite, amphibole and chlorite that form lenses, saddle-reefs and tension gashes are noted near fold closures. They generally parallel foliation and fold axes trends and have discontinuous lengths of 4.6 to 6.1 m. Associated sulphide minerals are pyrite, pyrrhotite and chalcopyrite. Assays of 0.34 to 0.55 g/t Au were obtained from quartz veins with minor to no visible sulfides.

DAVE 6 & 7 CLAIMS

Manson Creek Resources Ltd.	Gold
410, 1122 - 4th St. SW	85 O/13
Calgary, Alta., T2R 1M1	63°57'N, 115°37'W

REFERENCES

Wright (1954).
DIAND assessment report: 082132.

PROPERTY

DAVE 6 and 7 claims (1736 ha).

LOCATION

The claims are 190 km north-northwest of Yellowknife (Figs. 8-43, 8-44).

HISTORY

The claims were staked in December, 1984 and have now lapsed.

DESCRIPTION

The property is underlain by Archean supracrustal rocks of the Yellowknife Supergroup (Wright, 1954), including metaturbidites, metabasalts and metamorphosed felsic to intermediate volcanics. The supracrustals trend northeasterly and are steeply dipping (Fig. 8-43).

CURRENT WORK AND RESULTS

In 1985, 110 line-km of VLF EM and magnetometer survey was flown by Dighem Ltd. over the claims. Several geophysical anomalies were identified that appear to coincide with the contact between metasediments and metavolcanics.

BEAR 1-3

Comaplex Minerals Corp.	Gold
901, 1015 - 4th St. SW	85 N/8
Calgary, Alta., T2R 1J4	63°20'N, 116°15'W

REFERENCES

Lord (1942).
DIAND assessment report: 082840.

PROPERTY

BEAR 1-3.

LOCATION

The claims are centred on Strutt Lake on the Snare River, 150 km northwest of Yellowknife.

HISTORY

Gold exploration dates back to the late 1930's in the area and trenches were found on the property.

DESCRIPTION

The claims are underlain by metaturbidites of the Emile-Snare River supracrustal belt. This north-trending, 75 km long belt is up to 14 km wide and connects Indin Lake supracrustal belt to Russell Lake supracrustal belt. The belt comprises strongly foliated, amphibolite-grade Yellowknife Supergroup greywacke and shale intruded by porphyritic quartz-feldspar dykes which sometimes contain disseminated sulphides, principally arsenopyrite. Exposed in trenches, sheared dykes and sediments are cross-cut by quartz veins containing base metal sulphides.

CURRENT WORK AND RESULTS

In 1987, 733 1 to 3 lb. lake-bottom sediment samples were collected using a Standard GSC Torpedo dropped from a Huges 500D helicopter. Samples were analysed for gold, silver, arsenic, bismuth, copper and zinc to define anomalous areas for follow-up work.

RUSSELL LAKE - SLEMON LAKE SUPRACRUSTAL BELT

The Russell Lake-Slemon Lake supracrustal belt is in the southwestern Slave Structural Province. The supracrustal rocks, belonging to the Archean Yellowknife Supergroup, form a northerly trending belt that extends to the Emile River area (Lord, 1942) and is bounded and intruded by granitic batholiths and plutons (Fig. 8-54). Geological mapping at a scale of 1 inch to 4 miles by Lord in the late 1930's (Lord, 1942), and the map of Jolliffe (1936), included the Russell-Slemon lakes area. Henderson (1985) mapped the area around the southern part of Russell Lake. Jackson (1988) mapped the Russell and Slemon lakes area in greater detail (at a scale of 1:30 000).

Supracrustal rocks include minor amounts of mafic and felsic metavolcanics and abundant greywacke-mudstone metasediments, which represent a turbidite sequence similar to that found elsewhere in the Slave Province. The metasedimentary succession at Russell and Slemon lakes is characterized by abundant oxide and silicate amphibolitic iron formation that is locally sulfide rich (pyrite, arsenopyrite and pyrrhotite) and auriferous. Thus, the metasediments are distinct from those of both the Indin Lake and Yellowknife supracrustal belts and are more comparable to metasediments in the Point Lake-Contwoyto Lake (Lupin) region of the north-central Slave Province.

The supracrustal rocks have undergone at least three phases of folding, with F_1 and F_2 isoclines refolded about more open F_3 folds. Three foliation subsets post-date F_2 isoclines. Two major sets of post-Archean faults transect the area: north-northwesterly trending sinistral faults and easterly trending dextral faults. Quartz and quartz-carbonate veins were injected throughout the deformational history of the area.

Metamorphic grade ranges from greenschist to amphibolite facies. Within the metasedimentary rocks this transition is marked by a regional cordierite isograd. The isograd parallels the contact between the supracrustal rocks and the bounding granitic rocks and is offset by post-Archean faults.

The most significant gold find in iron formation is the BUGOW deposit at Cabin Lake which has estimated reserves of 70 000 tons of 10.29 g/t Au. Gold is hosted in sulfidic and amphibolitic iron formation that is interbedded and isoclinally folded with cordierite-bearing metasedimentary rocks. Other gold showings in iron formation include SP claims and North Slemon Lakes claims area (SAP showing), which are also contained within medium-grade metasediments, just above the cordierite isograd. However, iron formation within low-grade metasediments is also reported to contain anomalous amounts of gold (SHO and ORCA claims).

In the Russell Lake-Slemon Lake supracrustal belt, gold is found in a number of other geological environments including:

1. In mafic metavolcanics--MOS claims at Mosher Lake, which contain estimated reserves of 3 190 662 t grading between 2.40 and 5.14 g/t Au (DIAND assessment report 080774), or 500 774 t of 2.81 g/t Au for the main zone (DIAND assessment report 062166);

2. In quartz vein stockwork in greywacke--PHAROAH claims at Gold Island on Mosher Lake;

3. In quartz veins within granodiorite--Seven ores showing in southern Russell Lake area;

4. In shear zones developed within iron formation--Zone 15 in the north Slemon Lake area;

5. Associated with quartz-feldspar phyric granodioritic dykes which have intruded iron formation--El Grande showing in the north Slemon Lake area;

6. In quartz-feldspar phyric granodiorite intruded near or along the contact between mafic metavolcanics and metasediments--RUST showing in the south Russell Lake area.

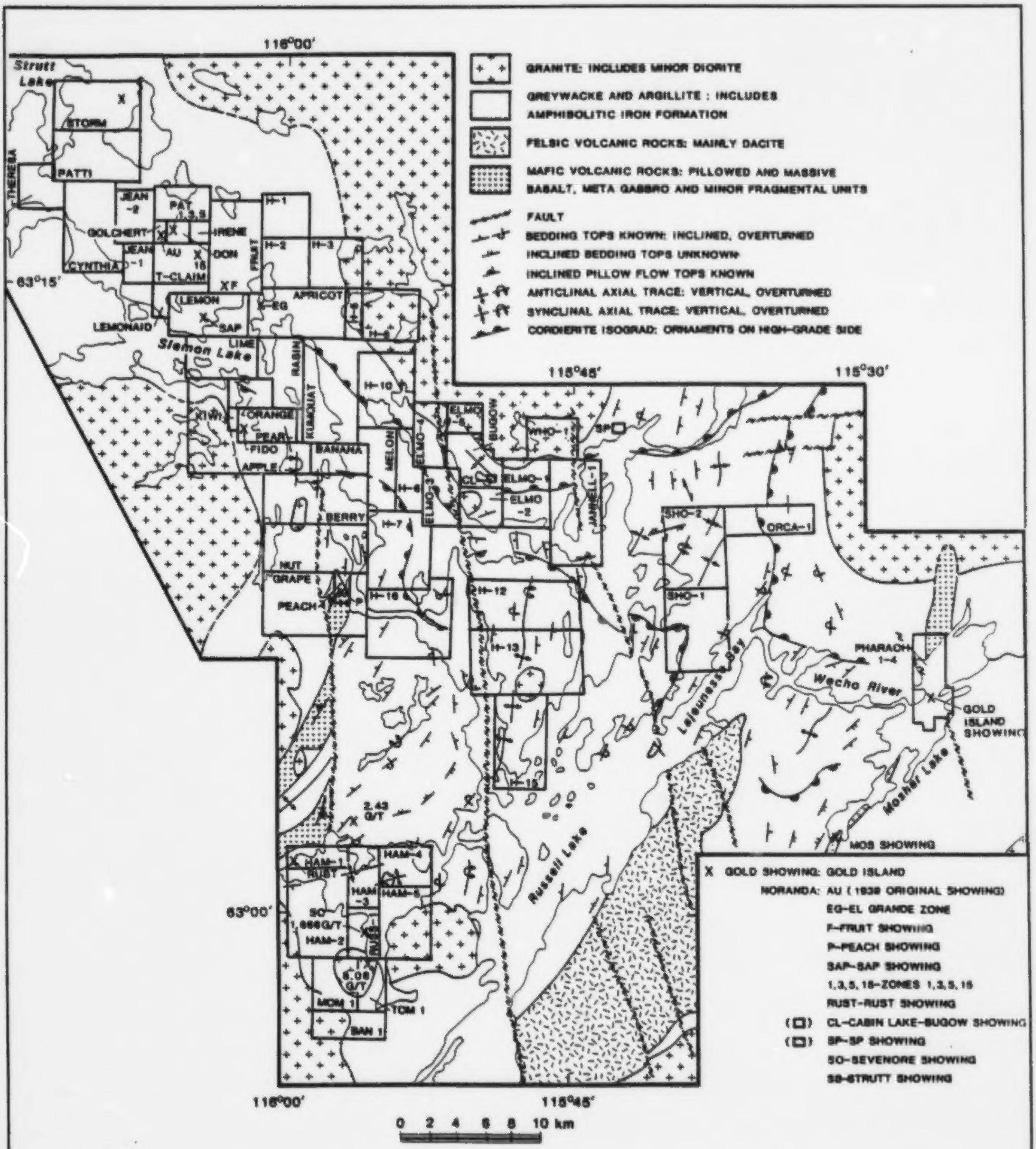

116°00'
GRANITE: INCLUDES MINOR DIORITE
GREYWACKE AND ARGILLITE : INCLUDES AMPHIBOLITIC IRON FORMATION
FELSIC VOLCANIC ROCKS: MAINLY DACITE
MAFIC VOLCANIC ROCKS: PILLOWED AND MASSIVE BASALT, META GABBRO AND MINOR FRAGMENTAL UNITS
FAULT
BEDDING TOPS KNOWN: INCLINED, OVERTURNED
INCLINED BEDDING TOPS UNKNOWN
INCLINED PILLOW FLOW TOPS KNOWN
ANTICLINAL AXIAL TRACE: VERTICAL, OVERTURNED
SYNCLINAL AXIAL TRACE: VERTICAL, OVERTURNED
CORDIERITE ISOGRAD: ORNAMENTS ON HIGH-GRADE SIDE
Strutt Lake
STORM
PATTI
THERESA
JEAN -2
PAT 1,3,5
GOLCHERT
IRENE
JEAN -1
AU
15
DON
CYNTHIA
T-CLAIM
FRUIT
H-1
H-2
H-3
63°15'
XF
APRICOT
LEMON
EG
SAP
H-5
H-6
LEMONAID
Slemon Lake
LIME
RABIN
KUMQUAT
H-10
KIWI
ORANGE
PEAR
FIDO
APPLE
BANANA
MELON
ELMO-4
ELMO-5
BUGOW
WHO-1
SP
115°45'
115°30'
ELMO-3
CL
ELMO-1
ELMO -2
JANNELL-1
H-8
BERRY
H-7
SHO-2
ORCA-1
NUT
GRAPE
PEACH
P
H-16
H-12
SHO-1
H-13
PHARAOH 1-4
Wecho River
Lejeunesse Bay
GOLD ISLAND SHOWING
H-15
Mosher Lake
2.43 G/T
Russell Lake
MOS SHOWING
HAM-1
HAM-4
RUST
HAM -3
HAM-5
63°00'
SO 1,666G/T
HAM-2
RUST
6.06 G/T
MOM 1
TOM 1
BAN 1
X GOLD SHOWING: GOLD ISLAND
NORANDA: AU (1939 ORIGINAL SHOWING)
EG-EL GRANDE ZONE
F-FRUIT SHOWING
P-PEACH SHOWING
SAP-SAP SHOWING
1,3,5,15-ZONES 1,3,5,15
RUST-RUST SHOWING
(▢) CL-CABIN LAKE-BUGOW SHOWING
(▢) SP-SP SHOWING
SO-SEVENORE SHOWING
SS-STRUTT SHOWING
116°00'
115°45'
0 2 4 6 8 10 km

FIGURE 8-54: Geology, gold showings and claim boundaries where 1986-87 work is reported in the Russell Lake-Slemon Lake area.

SLEMON LAKE PROJECT

Noranda Exploration Co. Ltd.
4 - 2130 Notre Dame Ave.
Winnipeg, Man., R3H 0K1

Gold
85 N/1,8; 85 O/4
63°16'N, 116°05'W

REFERENCES

Jackson (1988); Lord (1942, 1951).

DIAND assessment reports: 060069, 061574, 081634, 081786, 082305, 082509, 082524, 082638, 082766.

PROPERTY

JEAN 01, JEAN 02, LEMON, LEMONAID, THERESA, STORM, PATTI, CYNTHIA, KIWI, LIME, ORANGE, PEAR, PEACH, PLUM, BANANA, BERRY, GRAPE, NUT, APPLE, RAISIN, FRUIT CLAIM, APRICOT CLAIM, KUMQUAT CLAIM, MELON CLAIM, CHERRY, DONNA, PAT-85-1, DON, IRENE, GOLCHERT AND T-CLAIM.

LOCATION

The contiguous claims are centred on Slemon Lake, 45 km north of the village of Rae and 120 km northwest of Yellowknife.

HISTORY

The exploration history of the claim group from the late 1930's up to 1972 was summarised in table form by Seaton and Crux (1985). In 1972-73 Anglo United Development Corp. Ltd. reported that quartz veins cutting amphibolite contained up to 12.34 ppm Au across 0.61 m (DIAND assessment report 060069). In 1983 Host Ventures Ltd. drilled 9 holes on the DON claims and reported assays of up to 98 ppm Au across 1.5 m of sulfide-bearing greywacke and breccia (DIAND assessment reports: 081786, 061574). Noranda acquired the JEAN, LEMON and LEMONAID claims in 1981 and conducted prospecting, mapping and geophysical surveys in 1981-82, during which gold anomalies were detected in sulfide-bearing iron formation (DIAND assessment report 081634). Samples collected in 1984 returned assays of up to 12.5 ppm Au across 0.8 m. The T, PAT, IRENE and GOLCHERT claims were acquired by Noranda in 1985 and 1986 under seperate agreements with Interglobe Resources Ltd., Ghost Lake Resources Ltd. and the Irly Bird Syndicate (DIAND assessment report 082509). Noranda staked the remaining claims between July 1985 and October 1986.

DESCRIPTION

The property is underlain by sedimentary and subordinate mafic volcanic rocks that form a north-northwesterly trending arm of the Russell Lake-Slemon Lake supracrustal belt. The supracrustals are bound to the north, east and west by granitic intrusions (Fig. 8-54; Lord, 1942; Jackson, 1988). The cordierite isograd is traced through the sedimentary rocks that underlie the property. The presence of this isograd is significant as sulfide content of iron formation increases coincident with the increase in metamorphic grade.

Sedimentary rocks underlying the northern claims (PAT, IRENE, GOLCHERT and T) comprise interbedded greywackes and shales (argillites), with greywackes being slightly more abundant than argillites. Beds are generally <1 m wide, well graded and can be traced for hundreds of metres along strike. Rhythmically bedded greywacke-phyllite turbidites are exposed along the west shore of Slemon Lake and on the islands. Pelitic rocks comprising fine-grained, dark grey to black phyllite and slate predominate along the north and east shores of Slemon Lake. Numerous quartz veins and stringers, both discordant and conformable, are associated with the pelitic sequence.

Within the sedimentary sequence are interbedded silicate-sulfide and oxide iron formation. Iron formation is often developed at the transition between greywacke and argillite units, but is also found within the greywacke succession. At least three zones of iron formation have been mapped on the west shore of Slemon Lake and correlate with magnetic anomalies. The iron formation can be traced for 17 km along strike from southeast of Strutt Lake to southwest of Slemon Lake. Zones of iron formation range in thickness from 10 m to 70 m, consisting of several smaller bands within this interval, and are also traceable for hundreds of metres along strike. Silicate-facies amphibolitic iron formation locally contains pyrrhotite and pyrite with lesser amounts of arsenopyrite, marcasite, chalcopyrite, sphalerite and galena. Sulfide content varies, ranging from trace amounts to about 10%. Oxide iron formation consists of interbanded magnetite, chert and biotite-rich layers and forms weather resistant ridges.

Granitoid intrusions are multiphase and range from granite to granodiorite with lesser amounts of diorite. They are pink to light grey, variably foliated, medium to coarse grained and typically equigranular. Granodioritic quartz-feldspar porphyry sills, which may be related to the larger granitic intrusions, intrude metasedimentary rocks. The sills are 1 to 25 m wide and are locally folded. Gabbro and diabase dykes up to 50 m wide, with north, northwest and north-northeast trends, are also noted. Fine-grained pyrrhotite and trace magnetite combine to give a magnetic signature to diabase dykes.

Three phases of folding have been outlined; the first two resulted in isoclinal folds, as documented elsewhere in the region (Jackson, 1988). F_1 forms large scale, tight isoclines with axial trends ranging from north-northeast to north-northwest. Broader F_2 isoclines have northwest-trending axial traces. F_3 folds are open and gently warp F_1 and F_2 folds about east-northeast-trending axial traces. Three distinct cleavages are recognised, which are considered axial plane cleavages to the defined folds. Shear zones parallel F_2 axial planes and consist of schistose oxidized zones with chloritic alteration, minor quartz veins and local pyrrohtite, pyrite and arsenopyrite enrichment. Similar but less well developed shear zones are noted along F_1 axial traces.

Several gold-bearing zones in a variety of geological environments have been identified on Noranda's Slemon Lake claims. Anomalous gold concentrations (>100 ppb Au) are associated with: sheared, silicified and sulfidised oxide- to silicate-facies iron formation; high sulfide content; proximity to quartz-feldspar porphyry dykes and; proximity to the regional metamorphic isograd (highest gold assays obtained from the lower grade rocks adjacent to the isograd). The main gold showings are indicated on Figure 8-54 and described below.

Sap showing: Several parallel units of oxide- and silicate-facies iron formation, up to 6 m wide, are interbedded with turbidites. Sulfide-rich iron formation yielded up to 12.48 ppm Au. Silicification, quartz veining and sulfide-enrichment (pyrite, pyrrhotite and arsenopyrite) that is associated with the gold may be related to a north- to northeast-trending fault that flanks and parallels the zone of iron formation. Sap West showing, which yielded up to 64.4 g/t Au, is associated with arsenopyrite along the margins of a quartz-feldspar porphyry where it intrudes iron formation.

Zone 8: A wide gossan zone of sheared arsenopyrite-bearing pyritic shale and altered iron formation contains quartz veins and 10% sulfides. Resampling of a trench (1947-48) returned low, sporadic gold content (best analysis 0.22 g/t Au).

Zone 15 (T-CLAIM): Sheared and sulfidised silicate- to oxide-facies iron formation has a strike length of over 800 m. Gold and sulfide mineralisation was accompanied by silicification and chlorite alteration. Sampling of trenches (1946) and surrounding outcrops yielded assays ranging from 1.1 g/t Au over 3.6 m to 5.17 g/t Au over 3.3 m. The best assay from a grab sample contained 6.86 g/t Au over 1.5 m, 12% Cu and 690 g/t Ag.

El Grande zone: Assays of up to 10.65 ppm Au were obtained from arsenopyrite-rich, quartz-flooded samples collected from the contact between a felsic dyke and sheared turbidites. The best assays from saw-cut channel samples were 0.31 ppm Au across 0.75 m of felsic dyke and 0.40 ppm Au across 1.1 m of sheared country rock.

Zone 9: A zone of sheared and gossanous iron formation is intruded by a quartz-feldspar porphyry sill. Gold is associated with arsenopyrite, concentrated along the margins and contacts of the sill. Sampling of existing trenches returned 5.14 g/t Au over 1.83 m and 3.43 g/t Au over 2.07 m.

Fruit showing: A zone of chloritic, quartz-flooded phyllite carries 1 to 3% finely disseminated arsenopyrite needles. Assays ranged from 1.23 to 5.16 ppm Au.

Fido and Peach showings: Gold (up to 12.6 ppm Au) is associated with local concentrations of arsenopyrite in quartz veins cutting felsic porphyry dykes. The dykes range in width from 25 to 100 m and have been traced for 300 to 400 m.

Zone 1 and Zone 5 (DON claim--Interglobe Resources Ltd. option): A zone of quartz veins cutting turbidites, 82 m in length, is exposed in 1947 trenches. Visible gold is common in the quartz, which also contains pyrite and trace arsenopyrite. A description of Zone 1 is given in Lord (1951, p. 259-262). Zone 5, adjacent to Zone 1, consists of quartz veins in a shear carrying 3 to 5% arsenopyrite and 15 to 20% pyrite. An assay of 23.0 ppm Au was obtained from one grab sample.

Zone 3 (DON claim--Interglobe Resources Ltd. option): A zone of stockwork quartz veins cross-cuts turbidites approximately 600 m north-northeast of Zone 1. Veins are discontinuous and subhorizontal. A description of Zone 3 is given in Lord (1951, p. 259-262).

Strutt Lake showing: Massive arsenopyrite is developed in narrow silicified zones within sheared oxide/silicate facies iron formation. Composite grab samples yielded up to 9.43 g/t Au and 2.06 g/t Au.

CURRENT WORK AND RESULTS

In May 1986 a Dighem III geophysical survey was flown over a large portion of the claim area. During the spring of 1987 a 133 line-km grid was established over the north Slemon Lake area and an IP survey was conducted over portions of the grid, using both gradient array IP and dipole dipole IP. Detailed geological and structural mapping, prospecting, sampling, trench resampling and ground geophysical surveys were also carried out in 1986-87.

The airborne survey outlined ten conductive zones attributable to bedrock sources. The magnetic survey was useful in delineating granite-supracrustal contacts and anomalies that may correlate with either iron formation or mafic dykes. Ground geophysical surveys outlined four areas as priority targets based on coincident magnetic and EM anomalies. Anomalies found during the dipole-dipole IP survey on the SAP showing corresponded to zones of weakly sulfidised iron formation.

Six outcrops of iron formation along the shoreline of Slemon Lake were saw-channel sampled. The best assay from 97 samples was 0.47 ppm Au across 1.3 m (DIAND assessment report 082509).

During October-December 1987 eight holes totalling 1116.4 m were drilled on the claims (DIAND assessment report 082766) as follows: three holes on Zone 15 (GL-87-1 to GL-87-3); one hole on Zones 1 and 5 (GL-87-4); two holes on the northern extension of Zones 1 and 5 (IG-87-1, 2) and two holes on the SAP showing (R/S-87-1, 6). GL-87-1 intersected iron formation with 1 to 5% pyrrhotite, 1% pyrite and trace magnetite and sphalerite. The highest assay of 0.34 g/t Au over 0.5 m coincided with 5 to 6% pyrrhotite. Iron formation intersected in GL-87-2 contained 5 to 7% pyrite, 1 to 2% pyrrhotite, with a maximum assay of 0.34 g/t Au over 1.0 m. In this hole a zone of greywacke containing disseminated arsenopyrite assayed 3.8 g/t Au over 1.5 m. The best assay from GL-87-3 yielded 1.54 g/t Au over 1.0 m, in iron formation with 1 to 2% pyrite and pyrrhotite. GL-87-4 intersected Zone 1 shear zone, an altered and silicified zone approximately 10 m thick, containing numerous quartz veins and stringers and quartz-feldspar porphyry sills. This zone assayed up to 0.69 g/t Au over 1.0 m. Silicate-facies iron formation was also intersected, containing 1% pyrrhotite and 1% combined arsenopyrite and pyrite and assaying up to 0.51 g/t Au over 0.3 m.

Assays for hole R/S-87-1 (Sap showing; DIAND assessment report 082766) ranged from 1.72 g/t Au over 2.2 m up to 34.68 g/t Au over 1.0 m, with an averaged assay of 10.94 g/t over 4.0 m.

BUGOW CLAIMS

Highwood Resources Ltd.
700 - 1177 W. Hastings St.
Vancouver, B.C., V6E 2K3

Gold
85 O/4
63°14'N, 115°50'W

REFERENCES

Lord (1942); Brophy (1986); Seaton *et al.* (1987); Jackson (1988).

DIAND assessment reports: 082555, 082556, 082593, 082594.

PROPERTY

EMLO 1-5, H 6, H 10, WHO 1, BUGOW 1-20 (3943 ha).

LOCATION

The BUGOW gold property is 110 km northwest of Yellowknife, at the north end of Russell Lake (Fig. 8-54).

HISTORY

The property was staked by M.F. Thompson in 1939, restaked by Mr. Andy Bugow in 1945; in 1946 it was acquired by Andrew Yellowknife Mines Ltd. The claims were transfered to Rio Algom Ltd. in 1962, to Highwood Resources Ltd. in 1982, and to Cominco Ltd. in 1984. Six holes were drilled on the property in 1985 (Seaton *et al.*, 1987). The Cominco option expired in 1986 and the property reverted to Highwood Resources Ltd.

DESCRIPTION

The geology of part of the BUGOW claims area is shown in Figure 8-55. The claims are mainly underlain by Archean metasedimentary rocks, a sequence of interbedded greywacke and argillite, which are now cordierite and/or andalusite schists. Within these are lesser amounts of amphibolitic iron formation and garnetiferous schist. In the northern part of the claim group metasedimentary rocks are intruded by granite, which forms part of a batholith (Fig. 8-54). South of Cabin Lake the metasediments are intruded by a small granitic pluton. Pegmatitic, granitic, felsic porphyry and mafic dykes intrude the metasedimentary rocks and diabase dykes intrude all Archean units.

On the BUGOW claims first phase isoclinal folds (F_1) are northwesterly oriented and crossed by second phase, and possibly third phase (F_2, F_3), more open, northeasterly oriented folds (Fig. 8-55). The most prominent cleavage developed on the property is northwesterly trending, oriented 5° to 15° clockwise from bedding and is axial planar to minor folds that post-date F_1 (Brophy, Sept. 1986 Property Visit Report).

An east-trending regional metamorphic isograd just to the south of the property marks the boundary between low-grade rocks to the south and medium-grade (cordierite-andalusite-bearing) rocks to the north. The isograd parallels the margin of the granitic batholith to the north.

Gold is associated with iron formation, which comprises amphibole-rich siliceous beds that vary in width from several centimetres to over 10 m, and have discontinuous strike lengths of over 1 km (Fig. 8-55). Several distinct iron formation units have been identified on the property. Ampibolitic iron formation locally contains siliceous nodules, garnets and up to 25% sulfides. Pyrite, pyrrhotite and arsenopyrite, the main sulfides, vary from laminated or bedded to disseminated.

Ford (1988) has suggested that deformation and metamorphism of the amphibolitic units led to the concentration of gold in fold hinge zone areas, particularly where F_2 or F_3 folds are superposed on F_1 folds.

CURRENT WORK AND RESULTS

Drilling and detailed mapping carried out by Aber Resources Ltd. in 1986 and 1987 outlined a high-grade zone of about 70 000 t of 10.29 g/t Au. Freeport-McMoRan Gold Company has since acquired the option to earn 51% interest in the BUGOW property.

Between April and June 1987 Freeport-McMoRan contracted MPH Consulting Ltd. to carry out a helicopter borne geophysical survey (electromagnetic, resistivity, magnetic and VLF EM) and an extensive ground geophysical survey (magnetic, VLF EM, MaxMin HLEM and IP/resistivity). Subsequent work included bedrock trenching, rock-chip sampling (EMLO 1, 5 and H-10; DIAND assessment report 082593) and 68 m of BQ diamond drilling (EMLO 2; DIAND assessment report 082594). This work did not result in either the discovery of new economic gold-bearing zones or the enlargement of previously known zones.

JANELL-1

Kelmet Resources Ltd.	Gold
310, 441 - 5th Ave. SW	85 O/4
Calgary, Alta., T2P 2V1	63°10'N, 115°45'W

REFERENCES

Lord (1942); Jackson (1988).
DIAND assessment report: 082622.

PROPERTY

JANELL-1 (1046 ha).

LOCATION

The claim is 100 km northwest of Yellowknife, at the north end of Russell Lake (Fig. 8-54).

HISTORY

JANELL-1 was registered in May 1986.

DESCRIPTION

The claim is underlain mainly by Archean metasedimentary rocks (Fig. 8-54), moderately to thickly bedded, coarse-grained greywacke with subordinate thinly bedded argillite (Jackson, 1988). Iron formation is found to the west, north and east of the property, but may be only a minor component of the claim area (Jackson, 1988). The metasedimentary rocks are bounded to the north by a granitic batholith.

Bedding trends east-northeast in the southern part of the claim, but northerly in the north and central area. Two regional cleavages are developed with easterly and northerly trends.

A regional metamorphic isograd, marking the first appearance of cordierite and/or andalusite, is parallel to the margin of the granitic batholith in the northern claim area. A north-trending dextral fault transects the centre of the claim and offsets the metamorphic isograd.

CURRENT WORK AND RESULTS

During July 1987, Aerodat Ltd., on behalf of a joint venture agreement between Asamera Inc. and Kelmet Resources Ltd., flew 250 line-kms of electromagnetic, VLF EM and magnetometer surveys.

The survey data indicate:

1. The presence of numerous faults.

2. The most prominent magnetic anomalies are correlated with a diabase dyke and other small mafic intrusions rather than iron formation.

3. The rocks underlying Russell Lake may be enriched in mafic components relative to those of the surrounding exposed terrane.

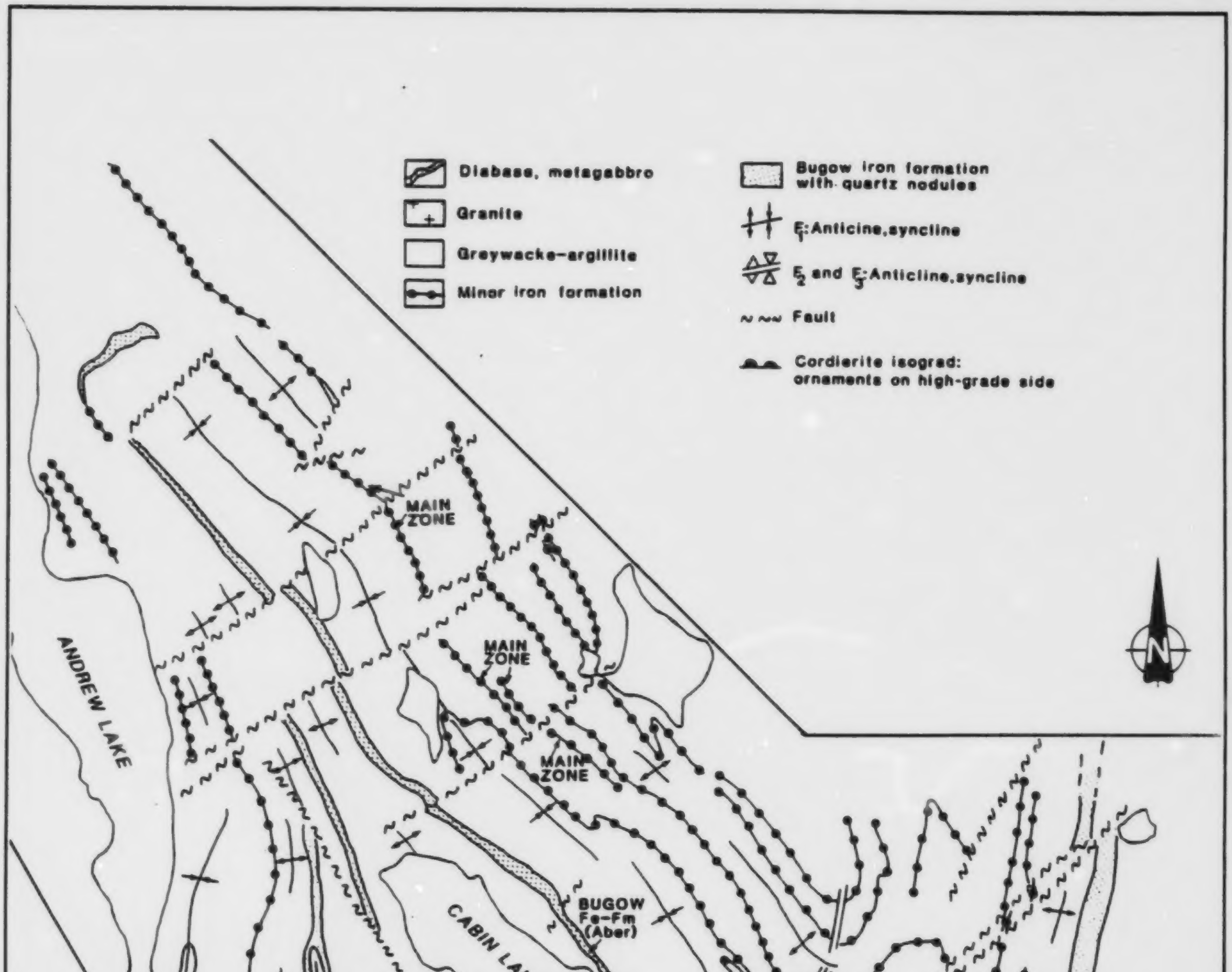

Diabase, metagabbro
Granite
Greywacke-argillite
Minor iron formation
Bugow iron formation with quartz nodules
F1:Anticine,syncline
F2 and F3:Anticline,syncline
Fault
Cordierite isograd: ornaments on high-grade side
ANDREW LAKE
MAIN ZONE
MAIN ZONE
MAIN ZONE
CABIN LAKE
BUGOW Fe-Fm (Aber)
?
N
0 100 300 500
metres

FIGURE 8-55:* *Geology of the BUGOW claims, Cabin Lake area.

H CLAIMS

Aber Resources Ltd.
400, 805 - 8th Ave. SW
Calgary, Alta., T2P 1H7

Gold
85 O/4
63°07'N, 115°50'W

REFERENCES

Lord (1942); Jackson *et al.* (1986a); Jackson (1988).
DIAND assessment report: 082664.

PROPERTY

H-12, H-13 (2092 ha).

LOCATION

The claims are approximately 130 km northwest of Yellowknife and a few kilometres south of the BUGOW property at Russell Lake (Fig. 8-54).

HISTORY

The claims were recorded in August 1986 and are forming part of a joint venture between Aber Resources and Tanqueray Resources Ltd.

DESCRIPTION

The property is underlain by north-trending, isoclinally folded sedimentary rocks which have been regionally metamorphosed to medium grade and have been intruded by a small granitic pluton. Sedimentary rocks in the western part of the property are thin-bedded argillites with minor interbedded amphibolitic iron formation, and those in the eastern part are thick-bedded greywackes which lack iron formation.

A northerly trending dextral fault parallels the shoreline of Russell Lake in the extreme western part of the property.

CURRENT WORK AND RESULTS

Work in July 1987 concentrated on mapping and sampling of the western part of the claims, to evaluate a north-trending ironstone reported in Jackson *et al.* (1986). The ironstone is a garnetiferous amphibolite, containing quartz ovoids, and is about 3 to 5 m wide and folded at its south end. Pyrite and arsenopyrite content within the ironstone is low and the highest gold assay obtained was 0.60 g/t Au.

RUSS 1, HAM 1-5

Noranda Exploration Co. Ltd.
4 - 2130 Notre Dame Ave.
Winnipeg, Man., R3H 0K1

Gold
85 J/13; 85 O/4
63°00'N, 115°55'W

REFERENCES

Lord (1942); Henderson (1985); Seaton and Crux (1985); Jackson (1988).
DIAND assessment reports: 081633, 082415, 082766.

PROPERTY

RUSS 1, HAM 1-5.

LOCATION

The claim group is about 20 km north of Rae and 104 km northwest of Yellowknife and is on a west bay of Russell Lake.

HISTORY

The property was originally part of the SEVENORE 1-12 claim group staked in 1945 upon the discovery of gold by K. Murray. The original Sevenore main showing, auriferous quartz veins in a granodiorite plug, is on the RUSS 1 claim. In 1946 the claims were acquired by Fort Rae Gold Mines Limited. The property was restaked later as the EKK claims. These lapsed and were restaked as TIP 1-28 by Kerr Addison Mines Ltd.

The RUSS 1,2 claims were recorded in May 1981 and the BET 1-7 claims were recorded in September 1981 (Seaton and Crux, 1985; DIAND assessment report 081633). The RUSS 2 claim was allowed to lapse and HAM 1-5 claims were staked in September 1986 (covering the old RUSS 2 and parts of BET 1-7 claims).

DESCRIPTION

The claims are underlain an Archean sequence of alternating thinly bedded argillite and more abundant thickly bedded greywacke and by granite-granodiorite plutons and pegmatitic, granitic, felsic porphyry and mafic dykes. Within the metasediments are amphibolitic and garnetiferous iron formation that are locally sulfide bearing (pyrite, pyrrhotite and arsenopyrite) and generally have a higher magnetite content than those mapped at Siemon Lake (DIAND assessment report 082766). In the northwestern part of the claim group mafic volcanic rocks form an elongate northeast-trending, southeast-facing sequence of massive and pillowed flows, fragmentals and metagabbro (Jackson, 1988). An extensive granitic terrane is west of the claims.

Bedding trends within the sedimentary rocks change from northerly in the southern area to northeast in the northern part of the claim group. Three phases of folding are documented in the sedimentary sequence and complex fold interference patterns are observed in lakeshore outcrops of argillaceous units and iron formation (Jackson, 1988).

CURRENT WORK AND RESULTS

In October 1986 major units of silicate oxide iron formation were mapped and trenches on the Sevenore showing were examined. During spring 1987 a 70 line-km grid was established and magnetometer and VLF surveys carried-out. Detailed mapping was conducted during the summer of 1987. Zones of interest defined by geophysical surveys correspond to iron formation and to the Sevenore showing. Surveys indicate the zone of mineralisation at Sevenore may extend 1200 m to the north.

The Sevenore showing is a series of discontinuous quartz veins, up to 1 m wide and 250 m long, hosted in a small granodiorite intrusion. Quartz veins contain pyrite, arsenopyrite, sphalerite, galena and native gold. Fine specks of gold are visible, and in one sample gold forms rims on sphalerite crystals. Visible gold was also found in quartz stringers within metasedimentary rocks. Iron formation within the sedimentary rocks surrounding the Sevenore stock assayed from 20 to 720 ppb Au. Samples from sheared iron formation assayed 3.05 g/t Au over 0.3 m.

Four holes totalling 737 m were drilled during October-December 1987 (DIAND assessment report 082766). Two holes (R/S-87-2,3) were drilled to test the Sevenore showing. The granodiorite stock contains disseminated sphalerite (from trace to 3%) and variable concentrations of arsenopyrite, pyrite and pyrrhotite. R/S-87-2 intersected visible gold in quartz veins that assayed 1 666.5 g/t Au over 0.35 m. Holes R/S-87-2 and 3 were also drilled to test a paired magnetic anomaly flanking the granodiorite, and hole R/S-87-4 tested the southern extension of this anomaly. These holes intersected banded oxide-facies iron formation, with narrow sulfide-rich bands, but no anomalous gold assays were obtained. Hole R/S-87-5, drilled on the northeastern shore of Russell Lake, was targeted on another magnetic anomaly and intersected 13.7 m of sulfide-rich (1 to 10% disseminated pyrite and pyrrhotite) iron formation, as well as intervals of banded oxide iron formation. Anomalous gold assays were not obtained.

BAN, MOM, TOM CLAIMS

Prolific Petroleum Ltd.	Gold
150, 1300 - 8th St. SW	85 J/13
Calgary, Alta., T2R 1B2	62°58'N, 115°57'W

REFERENCES

Henderson (1985).
DIAND assessment report: 082069.

PROPERTY

BAN 1, MOM 1, TOM 1 claims.

LOCATION

The claims are on the western shore of Russell Lake, 17 km northwest of Rae and 80 km northwest of Yellowknife.

HISTORY

SEVENORE 1-12 claims were staked in 1945 by K. Murray upon discovery of the Sevenore Stock gold showing immediately north of the TOM claim. In 1946, Bear Exploration and Radium Limited explored the gold showing. The claims lapsed and were restaked several times, recently as the RUSS and BET claims by Noranda in 1981. Samples of rusty fractures and quartz veins in the Sevenore Stock assayed up to 35 ppm Au. Anomalous gold concentrations (up to 15 ppm) were also obtained from samples of iron formation. Noranda's RUSS and BET claims lapsed in 1982.

The MOM, TOM and BAN claims were recorded for Prolific Petroleum Ltd. in August of 1986, soon after Aber Resources Ltd. reported gold assays from iron formation near the north end of Russell Lake.

DESCRIPTION

The property is underlain by cordierite-bearing pelitic metasediments of the Yellowknife Supergroup containing numerous interbeds of siliceous, amphibole-rich, silicate- and oxide-facies iron formation and minor segments of sulphide-facies iron formation with which gold is sometimes associated. In the northeast corner of the property, Henderson (1985) has defined a circular granodiorite intrusion, 2 km in diameter, which hosts the Sevenore stock showings.

CURRENT WORK AND RESULTS

In 1987, 55.5 line-km of VLF EM and magnetometer surveys were completed over a cut grid. The VLF EM survey delineated a number of strong northeast- and northwest-trending conductors. Narrow, linear magnetic highs in the northwest of the claims may be attributable to iron formation. The main magnetic linear appears to describe the nose of a northwest-closing fold whose axial surface strikes northwesterly.

SHO and ORCA CLAIMS

Continental Pacific Resources Ltd.	Gold
830, 355 Burrard St.	85 O/4
Vancouver, B.C., V6C 2G8	63°08'N, 115°38'W

REFERENCES

Jackson *et al.* (1986a); Lord (1942).
DIAND assessment report: 082145.

PROPERTY

SHO 1-2 (2007 ha), ORCA 1 (565 ha).

HISTORY

The claims were staked by Lou Covello and Navilius Holdings Limited and were optioned by Continental Pacific Resources Limited in 1986. There is no record of previous exploration on the property.

DESCRIPTION

The property is underlain by steep dipping, tightly folded, northeasterly trending, greenschist-grade turbidites and along the west shore of Lajeunesse Bay, silicate-facies iron formation on the southeast limb of an anticlinal structure (Fig. 8-54; Jackson *et al.*, 1986a).

CURRENT WORK AND RESULTS

In 1986, 112 line-km of HLEM and 105 line-km of magnetometer surveying at 10 m station spacing was completed over a cut grid. The grid is 160 line-km (Fig. 8-54). Along the shore of Lajeunesse Bay where iron formation is mapped (Jackson *et al.*, 1986a), line spacing was 80 m. The magnetic surveys identified a number of weak to moderate anomalies that are discontinuous along strike. Some of these appear to coincide with iron formation.

PHARAOH CLAIMS

D.G Thomas
Suite 1600 - 540 5th Ave. SW
Calgary, Alta., T2P 0M2

Gold
85 O/3
65°06'N, 115°22'W

REFERENCES

Lord (1941, 1942, 1951); Henderson (1985).
DIAND assessment report: 082088.

PROPERTY

PHARAOH 1-4 (547 ha).

LOCATION

The property, approximately 40 km north of Rae and 90 km west-northwest of Yellowknife, covers the area surrounding and including Gold Island, on the north-central part of Mosher Lake (Fig. 8-54).

HISTORY

In 1938 Alex Mosher discovered gold on the small island in Mosher Lake, now called Gold Island, and the CORRINE claim group was staked. These claims lapsed and part of the property was restaked in 1944 as the HILL, MONTY and ROSE claims by Yellowknife Mining Syndicate. In 1947 J.E. Stevens drilled two short holes on the property. Huhill Yellowknife Mines Ltd. then acquired the property and during 1946-47 drilled a total of 4 277 m. In 1973, Seaforth Mines Ltd. restaked the property as the MAG group of claims and carried out geophysical work and diamond drilling. In 1975, magnetic, VLF EM and CEM electrical surveys were conducted by Noranda Exploration.

DESCRIPTION

Lord (1942) provides the only regional geological map of the area. Archean supracrustal rocks in the area form a northeasterly trending extension of the Russell Lake-Slemon Lake supracrustal belt. Greywacke with lesser amounts of argillite underlie the claims. Diamond drill logs and sections indicate that minor metavolcanic rocks and conglomerate are within the greywacke suite. Southwest of the property is an elongate northerly trending mafic volcanic unit and to the north and east the metasedimentary rocks are intruded by the Stagg Lake Granite (Fig. 8-54; Henderson, 1985).

The showing, a quartz stockwork zone within the metasedimentary rocks on Gold Island, has been described in detail by Lord (1941, 1951). Minerals within the stockwork includes pyrrhotite, pyrite, chalcopyrite, arsenopyrite and native gold.

The best gold assays on the property to date were from samples of core drilled in 1974 (6.51 g/t Au across 10.07 m including 19.20 g/t Au across 3.05 m and 7.89 g/t Au across 5.80 m).

CURRENT WORK AND RESULTS

Showings on Gold Island were examined in July 1986. The quartz stockwork is interpreted to be conformable to bedding within the metasedimentary rocks and to be folded by two and possibly three fold sets. Examination of previous diamond drill results indicates the quartz stockwork zone is open at depth.

YELLOWKNIFE SUPRACRUSTAL BASIN

Remnants of Archean Yellowknife Supergroup rocks at the southern edge of the Slave Structural Province stretching 120 km east of Yellowknife and nearly 200 km north from Great Slave Lake form the Yellowknife supracrustal basin (Padgham, 1981). Granodioritic intrusive rocks border the basin to the east, west and southwest whereas to the north the basin grades into migmatitic equivalents of the Yellowknife Supergroup. Although the southern limit of the basin is hidden under Great Slave Lake, it is interpreted to extend at least 10 km southwest (Gibb and Thomas, 1980). It is intruded by Aphebian alkaline granitoid rocks and intersected by the East Arm Fold Belt. The area of the basin is covered by parts of NTS 85 J, 85 O, 85 P and 85 I. Figure 8-56 depicts geology and major deposits of the basin. Figure 8-57 outlines geological maps for the area.

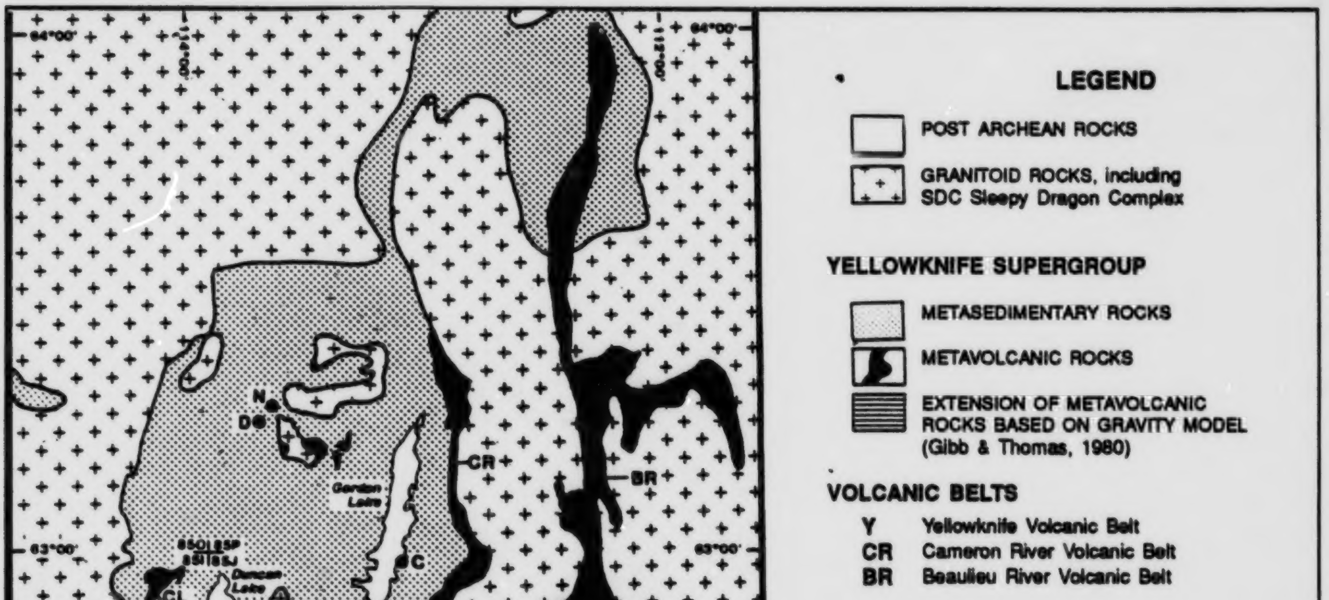
Yellowknife Supergroup rocks locally overlie metamorphosed and deformed basement granitoid plutons and gneisses however contacts are typically highly deformed and sheared. The Supergroup includes discontinuous volcanic belts. The principal ones, Yellowknife (Padgham, 1987) and Cameron-Beaulieu (Lambert, 1988), are between extensive complexes of granitic and gneissic rocks and, overlying, Yellowknife Supergroup greywacke-mudstone turbidites of the Burwash Formation. The turbidites represent the main basin fill derived from a mixed felsic volcanic and granitoid source. Local conglomerate and shallow-water lithic to quartz-rich sandstones are interpreted to define the basin margins, as may the volcanic belts (Henderson, 1985). The volcanic belts are thick accumulations of mainly basaltic to andesitic subaqueous flows, gabbroic sills and felsic volcanic complexes that built up above water level including Clan-Sito-Quyta Lake area, the Yellowknife area and Victory-Turnback-Sunset Lake area (Figs. 8-56, 8-57).

Rocks of the basin were complexly folded during at least two phases of deformation (Henderson 1985; Fyson 1987). The volcanic belts are steeply dipping homoclines. The relatively incompetent Burwash Formation sediments are complexly folded into steeply dipping isoclines of highly varied trend and wavelength and in places complex interference patterns are developed. The metamorphic pattern as outlined by the cordierite isograd is apparently controlled by local thermal anomalies associated with emplacement of granitoid plutons. Rocks along the margins of the basin, particularly in proximity to large plutons, are at amphibolite grade.

The majority of the granitoid plutons were intruded in the Late Archean (2.55-2.6 Ga), they include: (1) subvolcanic, stocks, dykes and sills associated with mafic to felsic volcanism, (2) syntectonic to late tectonic mesothermal tonalite-granodiorite batholiths and (3) late tectonic granodiorite-granite-leucogranite-pegmatite dykes, stocks and batholiths (Ayres and Cérny, 1982). Henderson (1985) formalized the terminology of the granitoid rocks in and around Yellowknife Basin; the majority belong to one of seven units: (1) Anton and (2) Sleepy Dragon complexes (3) Defeat (4) Stagg (5) Meander Lake and (6) Awry plutonic suites, and (7) Prosperous Granite.

Deposits of economic interest within supracrustal rocks of the Yellowknife basin (Fig. 8-56) include gold, in a variety of settings, base metals and pegmatites. Most gold production, in excess of 350 000 kg, has come from Giant Yellowknife Mine and NERCO-Con Mine where gold is in quartz-carbonate or quartz veins and lenses within brittle-ductile shear zones cross-cutting basalts of the upper Kam Group, Yellowknife volcanic belt. However, numerous small high-grade gold-bearing quartz veins in the sediments of the Burwash Formation have been mined, including Thompson-Lundmark, Camlaren and Ptarmigan mines (Fig. 8-56) which have produced in total over 3300 kg of gold (Padgham, 1984). Other exploration targets for gold include: structurally controlled quartz veins hosted within metasediments, such as Discovery Mine (Fig. 8-56) which produced 1 t of gold; quartz veins and shear zones developed between lithologies with competency contrast, such as the Nicholas Lake deposit; along lithologic contacts, for example the MON deposit; and within iron-rich zones along volcanic-sedimentary contacts, for example showings on the TING, WAL, EQUINOX claim group and the LONGSPUR main showing. Volcanogenic massive sulphide deposits are hosted by the volcanic belts and within the Beaulieu River volcanic belt include the 1987 discovery, the polymetallic Sunrise deposit with reserves of 1.87 Mt grading 8.9% Zn, 4.2% Pb, 404.6 g/t Ag and 1.029 g/t Au, and the Turnback Lake deposits (Fig. 8-56).

Within the Yellowknife Basin numerous pegmatite dykes cross-cut mainly Burwash Formation turbidites to form the Yellowknife pegmatite field. The pegmatites demonstrate regional zonation relative to youngest Archean, commonly two mica granites. Zoned beryllium-rich pegmatites are closest to these intrusions, further out are columbium-tantalum-rich bodies and farthest away (up to 4 km) are simple lithium-rich pegmatites (Jolliffe, 1944; Mulligan, 1965; Kretz, 1968; Lasmanis, 1978; Wise *et al.*, 1985). Prospecting in the area for lithium and other rare elements such as beryllium, niobium, tantalum and tin began during the Second World War, and columbite-tantalite concentrates were recovered between 1946 and 1948. Canadian Superior Exploration Limited tested pegmatites in the area in the 1970's (DIAND assessment report 080274).


64°00'
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N
D
Y
Gordon Lake
CR
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Duncan Lake
M
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SDC
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TL
V
PT
G
YELLOWKNIFE
NC
R
B
W
E
Great Slave Lake
LEGEND
POST ARCHEAN ROCKS
GRANITOID ROCKS, including SDC Sleepy Dragon Complex
YELLOWKNIFE SUPERGROUP
METASEDIMENTARY ROCKS
METAVOLCANIC ROCKS
EXTENSION OF METAVOLCANIC ROCKS BASED ON GRAVITY MODEL (Gibb & Thomas, 1980)
VOLCANIC BELTS
Y Yellowknife Volcanic Belt
CR Cameron River Volcanic Belt
BR Beaulieu River Volcanic Belt
FELSIC COMPLEXES
CL Clan Lake
SL Sito Lake
Q Quyta Lake
T Turner Lake
V Victory Lake
S Sunset Lake
E East Mirage Islands
W West Mirage Islands
ORE DEPOSITS
■ Producing gold mines: G, Giant; NC, Nerco-Con; PT, Tom Ptarmigan.
● Past gold producers: C, Camlaren; D, Discovery; TL, Thompson-Lundmark; R, Ruth; B, Beaulieu; M, Mon.
○ Base metal massive sulphide deposits: SV, Sunrise; TV, Turnback Lake.
X Lithium, beryllium, pegmatite prospect.

FIGURE 8-56: Geology and mineral deposits of the Yellowknife supracrustal basin.

BOSS CLAIMS

Noranda Exploration Co. Ltd.	Gold
(N.P.L.)	85 J/16
4 - 2130 Notre Dame Ave.	62°57'N, 114°10'W
Winnipeg, Man., R3H 0K1	

REFERENCES

Helmstaedt *et al.* (1985); Henderson (1985); Hurdle (1983, 1984, 1985); Jackson *et al.* (1986); Jolliffe (1939).

DIAND assessment report 082333.

PROPERTY

BOSS 1-9 (4588.71 ha).

LOCATION

The BOSS claim group is about 55 km north of Yellowknife and includes the area around the northern part of Clan Lake (Figs. 8-56, 8-57, 8-58).

HISTORY

Prospecting for gold and silver in the Clan Lake area began in the thirties. In 1964 the Earl Jack Syndicate discovered a gold showing and staked the EL claims which are now covered by BOSS 9. No detailed work was reported on the EL group. BOSS 1-9 were recorded for Noranda Exploration Ltd. between April, 1985 and September, 1986.

DESCRIPTION

The BOSS claims, at the northern end of the Yellowknife volcanic belt, are underlain by Archean Yellowknife Supergroup metavolcanic and metasedimentary rocks (Fig. 8-58; Jolliffe, 1939; Henderson, 1985; Hurdle, 1983, 1984, 1985; Helmstaedt *et al.*, 1985; Jackson *et al.*, 1986c). The supracrustal sequence consists of lower andesitic flows overlain successively by dacitic flows and ash tuffs, volcaniclastic conglomerates, sandstones and pelites, rhyolitic and dacitic ash deposits and upper andesite-basalt intercalated with volcaniclastics and ash fall deposits of the Clan Lake volcanic complex (Hurdle, 1983). The rocks were deformed during two phases of isoclinal folding and during the formation of three regional cleavages, which post-date folding (Hurdle, 1985). The domical structure outlined by volcanic rocks on the NOSE claim group (Fig. 8-58) formed prior to these structures. Metamorphic grade increases to the east and west from a low-grade zone centred along Sito, Clan and Johnston lakes. The north-northeast-trending Yellowknife River fault passes to the west of the BOSS claims.

CURRENT WORK AND RESULTS

In 1985 and 1986 Noranda carried out prospecting and geological, geochemical and airborne geophysical surveys including a 485 line-km Dighem helicopter-borne electromagnetic, resistivity, magnetic and VLF EM survey. Prospecting concentrated on gossan zones and quartz veins along the western margin of the Clan Lake volcanic pile. Several showings were discovered (Fig. 8-58); best assays from BOSS 1 ranged from 73 g/t to 229 g/t Au. The best assays from channel samples on BOSS 1 and 7 are 29.2 g/t Au over 0.8 m, 25 g/t Au over 0.56 m and 3.9 g/t Au over 0.49 m. The EL showing on BOSS 9 was re-examined; one grab sample returned 96.7 g/t Au, 106.3 g/t Ag and 1% Pb (Fig. 8-58). A sulfide-bearing zone along the sedimentary volcanic contact and within the sedimentary unit was outlined by a string of magnetic highs.

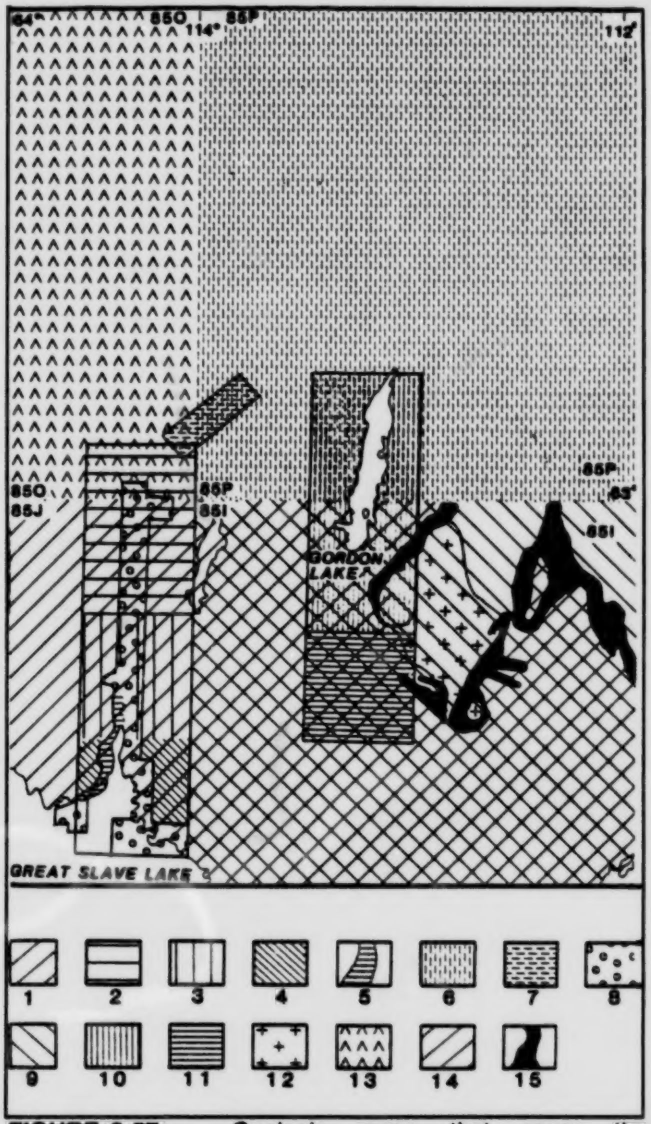


FIGURE 8-57: Geologic maps that cover the Yellowknife supracrustal basin.

TORO CLAIMS

Giant Yellowknife Mines Ltd.	Gold
Bag 3000	85 J/16
Yellowknife, NWT, X1A 2M2	63°51'N, 114°07'W

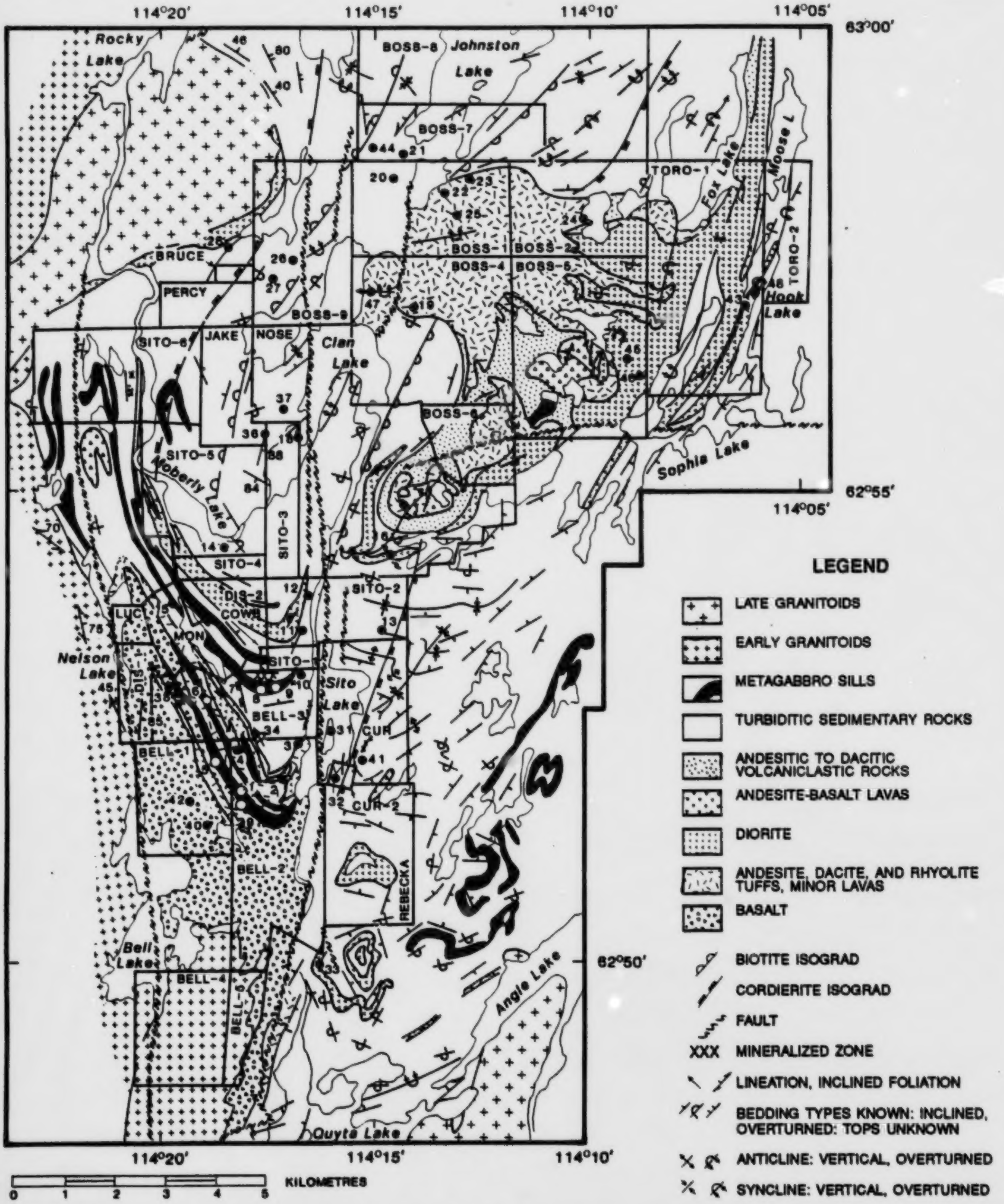
REFERENCES

Hurdle (1983, 1985).

DIAND assessment reports: 017227, 082358.

Key to Fig. 8-57: Geologic Maps that cover the Yellowknife supracrustal basin

No. Area NTS	Reference	Scale
1. 85 I,J,K,N,O,P	Jolliffe, A.W. (1936), Yellowknife River Area, Northwest Territories. GSC Paper 36-5.	1 in to 8 mi
2. 85 J,0	Jolliffe, A.W. (1939), Preliminary Maps, Quyta Lake and parts of Fishing Lake and Prosperous Lake Areas, Northwest Territories. GSC Paper 39-6.	1 in to 1/2 m
	Jolliffe, A.W. (1940), Quyta Lake and Parts of Fishing Lake and Prosperous Lake Areas, Northwest Territories. GSC Paper 40-14.	
3. 85 J	Jolliffe, A.W. (1946), Prosperous Lake, District of Mackenzie, Northwest Territories. GSC Map 868A.	1 in to 1 mi
4. 85 J	Jolliffe, A.W. (1942), Yellowknife Bay, District of Mackenzie, Northwest Territories. GSC Map 709A.	1 in to 1 mi
5. 85 J/8,9	Henderson, J.F. and Brown, I.C. (1966), Geology, Yellowknife Greenstone Belt, District of Mackenzie. GSC Bulletin 141, GSC Map 1193A.	1:12 000
6. 85 P Carp Lakes	Moore, J.C.G., Miller, M.L., and Barnes, F.Q. (1951), Second Preliminary Map, Carp Lakes, Northwest Territories. GSC Paper 51-8.	1 in to 4 mi
7. 85 O,P	Tremblay, L.P. (1952), Giaque Lake, District of Mackenzie, Northwest Territories, GSC Memoir 266, GSC Map 1017A.	1 in to 2000 ft
8. Yellowknife volcanic belt parts of 85 J/7,8	Helmstaedt, H. *et al.* (1979), Preliminary geology of the southern end of the Yellowknife Greenstone Belt. NWT Geology Div., DIAND. EGS 1979-9.	1:7500
parts of 85 J/9	Hauer, L.M. (1979), Preliminary geology map of the northern end of the Yellowknife Greenstone Belt. NWT Geology Div., DIAND. EGS. 1979-10.	1:8500
85 J/9	Helmstaedt, H. *et al.* (1980), Preliminary geology map of Banting and Walsh Lakes areas. NWT Geology Div., DIAND. EGS 1980-5.	1:8500
85 J/9	Easton, R.M. and Jackson, V.A. (1981), Geology of the Walsh Lake area. NWT Geology Div., DIAND. EGS 1981-3.	1:10 000 1:25 000
85 J/8,9	Easton, R.M. *et al.* (1982b), Geology of the east side of Yellowknife Bay. NWT Geology Div., DIAND. EGS 1982-5.	1:25 000 1:10 000
85 J/15,16	Hurdle, E. (1983), Geology of a Volcanic Pile at Clan Lake. NWT Geology Div., DIAND. EGS 1983-5.	1:25 000 1:10 000
85 J/9,16	Yeo, G.M. *et al.* (1983), Preliminary geology of Quyta Lake area. NWT Geology Div., DIAND. EGS 1983-7.	1:50 000
85 J/16	Helmstaedt, H., *et al.* (1985), Geology of the Sito Lake area. NWT Geology Div., DIAND. EGS 1985-10.	1:10 000 1:20 000
85 J/9,16	Jackson, V.A., *et al.* (1986c), Geology of the Quyta Lake area. NWT Geology Div., DIAND. EGS 1986-2.	1:10 000 1:20 000
85 J/7,8	Relf, C. and Nicolson, D.C. (1986a), Geology of the West Mirage Islands. NWT Geology Div., DIAND. EGS 1986-5.	1:2000
85 J/1,8	Relf, C. and Nicolson, D.C. (1986b), Geology of the East Mirage Islands. NWT Geology Div., DIAND. EGS 1986-15.	1:2000
85 J/8	Brophy, J.A. (1986), Geology of the Lower Crestaurum Formation in the Fred Henne Park Area. NWT Geology Div., DIAND. EGS 1986-13.	1:2000
85 J/7,8	Pelletier, K.S. and Wahlroth, J.M. (1986), Geology of the southwestern Yellowknife Bay area. NWT Geology Div., DIAND. EGS 1986-12.	1:10 000
85 J/8	Roach, D. (1988), Geology of the southeast part of Yellowknife Bay. NWT Geology Div., DIAND. EGS 1988-2.	1:20 000
9. 85 I	Henderson, J.F. and Jolliffe, A.W. (1941), Beaulieu River, District of Mackenzie, Northwest Territories. GSC Map 581A.	1 in to 4 mi
10. 85 P,I	Henderson, J.F. (1941), Gordon Lake, District of Mackenzie, Northwest Territories. GSC 644A and Gordon Lake South, District of Mackenzie, Northwest Territories. GSC Map 645A.	1 in to 1 mi
11. 85 I	Fortier, Y.O. (1947), Preliminary Map, Ross Lake, Northwest Territories. GSC Paper 47-16.	1 in to 1/2 mi
12. 85 I/10,11,14,15	Davidson, A. (1972), Granite Studies in the Slave Province. GSC Paper 72-1A, p109-115 (and unpublished).	1:300 000 (1:50 000)
13. 85 NW	Douglas, R.J.W. *et al.* (1972), Geology of Horn River, District of Mackenzie. GSC Map 1372A.	1:500 000
14. 85 J,I	Henderson, J.B. (1985), Geology of Yellowknife-Hearne Lake area, District of Mackenzie: a segment across an Archean basin. GSC Memoir 414, GSC Map 1601A.	1:250 000
15. parts of 85 I/9, 10,11,14,15,16	Lambert, M.B. (1988), Cameron River and Beaulieu River Volcanic Belts of the Archean Yellowknife Supergroup, District of Mackenzie, Northwest Territories. GSC Bulletin 382.	1:50 000


114°20'
114°15'
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63°00'
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Rocky Lake
Johnston Lake
BOSS-8
BOSS-7
BOSS-1
BOSS-2
BOSS-4
BOSS-5
BOSS-6
BOSS-9
TORO-1
TORO-2
Fox Lake
Moose L
Hook Lake
Sophia Lake
BRUCE
PERCY
SITO-6
JAKE
NOSE
Clan Lake
SITO-5
Moberly Lake
SITO-3
SITO-4
SITO-2
SITO-1
DIS-2
COWB
LUC
MON
DIS-1
Nelson Lake
Sito Lake
BELL-3
BELL-1
BELL-2
BELL-4
BELL-5
CUR
CUR-2
REBECKA
Bell Lake
Angle Lake
Quyta Lake
LEGEND
LATE GRANITOIDS
EARLY GRANITOIDS
METAGABBRO SILLS
TURBIDITIC SEDIMENTARY ROCKS
ANDESITIC TO DACITIC VOLCANICLASTIC ROCKS
ANDESITE-BASALT LAVAS
DIORITE
ANDESITE, DACITE, AND RHYOLITE TUFFS, MINOR LAVAS
BASALT
BIOTITE ISOGRAD
CORDIERITE ISOGRAD
FAULT
XXX MINERALIZED ZONE
LINEATION, INCLINED FOLIATION
BEDDING TYPES KNOWN: INCLINED, OVERTURNED: TOPS UNKNOWN
ANTICLINE: VERTICAL, OVERTURNED
SYNCLINE: VERTICAL, OVERTURNED
0
1
2
3
4
5
KILOMETRES

FIGURE 8-58: Geology, showings and claims where 1986-87 work is reported in the northern Yellowknife volcanic belt (Geology modified from Hurdle (1983), Helmstaedt et al. (1985), Henderson (1985) and Jackson et al. (1986c)). (numbers refer to showings listed opposite)

Showing ●	Assay (g/t Au)
1. DEL'S (N)	1.0 to 8.3
2. KOL'S (N)	4.5, 1.8
3. ZONE 1 (N)	80.1, 2.0, 98.6/1 m
4. KOL'S (N)	1.2, 7.8, 2.4
5. KOL'S (N)	10.0
6. OLD TRENCHES	1.3, 30.2
7. LIL 8 LILEX	Au/Ag panned
8. KOL'S (N)	24.7, 2.3, 2.3
9. KOL'S (N)	42.0, 1.9, 42.0, 42.9, 57.3
10. OLD TRENCH	9.9
11. KOL'S (N)	27.8
12. KOL'S (N)	1.3
13. KOL'S (N)	4.1, 3.5
14. COMINCO'S 1930	1.4, 1.7
15. MON (DDH)	0.7, 1.0, V.G. surface showing
16. NOSE (Past Producer)	15.1 kg Au, 3.5 kg Ag from 1035.1 t ore. Grade 14.5 g/t 1984 trench samples up to 189 Au
17. NOSE	Main Showing
18. SJE	3.8/1 m
19. 1985(N)	1.3
20. 1985(N)	73.0
21. 1985(N)	229, 4
22. 1985(N)	1.5, 4.0, 2.9
23. 1985(N)	2.4, 1.1, 89.5, 158.4
24. 1985(N)	2.4, 1.7
25. 1985(N)	1.1, 1.5
26. E.L. (1930)	82.9, 57.3, 3.5
27. E.L. (1930)	131, 97, 18 Au, 1248, 108.3 Ag, 1%Pb
28. COMINCO 1930	1.03
29. COMINCO 1930	3.43
30. COMINCO 1930	12.69
31. CHAS	2.1/0.3
32. CAR	1.7 to 23
33. YK BEAR (1930)	3.1
34. KOL'S (N)	15.6
35. KOL'S (N)	17.2, 12.8
36. JAKE (N)	8.8/1.5 m
37. VICTORY COP, 1947	5.14, 3.8
38. J8B (N)	3.6/1, 2.5/2 m Zone 2
39. ADAM (N)	3.8
40. T-BONE(N)	6.5, 7.8, 6.0
41. CUR/MASON	75
42. P.J.	
43. EARL JACK SYN.-BOULDER	26 g/t
44. 1985(N)	1.4 g/t Au
45. 1985(N)	2.0, 1.4, 1.1 Au
46. 1985(N)	1.1 Au
47. 1985(N)	2.6 Au
48. EARL JACK SYN	9.3

(N) - NORANDA

PROPERTY

TORO 1, 2.

LOCATION

TORO 1 and 2 are 55 km north of Yellowknife, covering part of Sophia Lake (Fig. 8-58).

HISTORY

In 1940, high-grade gold-bearing boulders were discovered in the overburden of a northeast-trending linear topographic depression near the northern end of Hook Lake (Fig. 8-58). The quartz-mica schist boulders contain up to 35% sulfides, mainly arsenopyrite and pyrite with minor amounts of pyrrhotite and chalcopyrite. The IVY 1-8 and RIT 1-10 claims covering the float showing was held by a group of Yellowknife prospectors, chiefly Joe Harriman. The ground was optioned in 1945 or 1946 by J. Mason and several short holes were drilled to test the ground under the depression. The property was in good standing until 1963 when it was restaked as the WJ claim group for Earl Jack Syndicate (DIAND assessment report 017227). Geophysical surveys carried out in 1963-64 failed to locate the bedrock source of the boulders but defined one significant conductor within the eastern basaltic unit. This was drilled and assayed, yielding anomalous results for gold and is now covered by TORO 2 claim.

In 1985 the joint venture partners Giant Yellowknife Mines Ltd., Asamera Inc. and Kelmet Resources Ltd. mapped, sampled and prospected the claims. Two grab samples from a 1940 overburden trench assayed 21.39 g/t Au and 10.29 g/t Au. Soil sampling of the trench area yielded from 80 to 800 ppb Au and indicated that the source of the gold-bearing float may be beneath Hook Lake. A rusty, pyritic quartz-sericite zone within rhyodacite tuff was also sampled. Most samples from this zone assayed less than 60 ppb Au, but one sample assayed 95 ppb Au.

DESCRIPTION

The property is underlain by north-northeast-trending metavolcanic and metasedimentary rocks that form the north part of the Yellowknife volcanic belt which includes the distal portion of the Clan Lake volcanic complex (Hurdle, 1983, 1985). Volcanic flows, tuffs, breccias and volcaniclastic rocks range from andesite to basalt and rhyolite to dacite. Sedimentary rocks consist of greywacke, siltstone and pelitic schists. The sequence has been folded about north-northeast-trending isoclines. Sedimentary rocks are cordierite and/or andalusite bearing and volcanic rocks are garnet-amphibole bearing.

CURRENT WORK AND RESULTS

In 1986, Giant Yellowknife completed a 210 line-km Dighem airborne survey and detailed ground surveys over the trench area. Prospecting and sampling was done across the topographic depression as well as the eastern mafic flows and western sulfidic felsic volcanic units, which were also trenched. Boulders were not found within the original trench (which did not reach bedrock), but several found in the surrounding talus were gold bearing. Samples from trenches cut in felsic and mafic volcanic rocks assayed up to 0.17 g/t Au. Samples of iron-stained volcanic and sedimentary rocks collected throughout the area yielded up to 0.685 g/t Au.

SITO PROJECT

Noranda Exploration Co. Ltd.	Gold
4 - 2130 Notre Dame Ave.	85 J/16
Winnipeg, Man., R3H 0K1	62°52'N, 114°15'W

REFERENCES

Helmstaedt *et al.* (1985); Henderson (1985); Hurdle (1983); Jackson *et al.* (1986c); Jolliffe (1942); Little (1985); Yeo *et al.* (1983).

DIAND assessment reports: 017328, 017336, 017431, 019529, 082620.

PROPERTY

BELL 1-5, SITO 1-6, COWB, JAKE, PERCY, BRUCE (4454.9 ha).

LOCATION

The property is 45 km north of Yellowknife, on the west side of the Yellowknife River (Fig. 8-58).

HISTORY

The first claims in the area were the QUYTA claims of Yellowknife Bear Mines Ltd., recorded in 1933, and Cominco's MON claims at Discovery Lake (5 km northwest of Sito Lake), recorded in 1937. The MON gold showing (Figs. 8-56, 8-58), visible gold in quartz veins, is at a metasediment-metagabbro contact. The Victory Cop gold showing, 5 km north-northwest of Sito Lake, was drilled by Beulah Yellowknife Mines Ltd. in 1947. Gold and silver was panned from quartz veins in gabbro at the LIL and LILEX showing, south of Discovery Lake. This showing, now covered by BELL 3, was owned by Oro Plata Mining in the 1930's and by Fairmount Minerals Ltd. in the 1960's. In the 1960's parts of the BELL claims were held as the PJ and JCJ claims. Noranda acquired the BELL claims in 1981. The ground was allowed to lapse in 1983, but was restaked in 1986 and 1987. The SITO 1 claim was recorded in October 1986, while SITO 2-6, COWB, JAKE, PERCY and BRUCE claims were acquired in 1987.

DESCRIPTION

The claims are in the northern part of the Yellowknife volcanic belt (Fig. 8-58; Jolliffe, 1942; Henderson, 1985). The property is underlain by a folded sequence of mafic to intermediate volcanics and minor felsic pyroclastic rocks, quartz porphyry and gabbro intrusions, all of which are overlain by, and to varying degrees intercalated with, turbiditic sedimentary rocks. This sequence represents part of the Sito Lake volcanic complex (Hurdle, 1983; Yeo *et al.*, 1983; Helmstaedt *et al.*, 1985; Little, 1985; Jackson *et al.*, 1986c). The Sito Lake volcanic complex is separated from Clan Lake equivalents by the northern extension of the Hay-Duck Fault. The north-trending Hay-Duck Fault, which is partially defined by a shear zone up to 300 m wide along the west shore of Sito Lake, has left lateral displacement of 4 to 5 km. The amount of vertical displacement is unknown. The Sito Lake fold (Helmstaedt *et al.*, 1985; Little, 1985), a northwest-trending and facing, steeply north-plunging syncline (Fig. 8-58), is the most obvious large scale structure. Small scale basin and dome fold interference patterns in the claim area are manifested in the larger scale Clan Lake dome (Hurdle, 1985) and in sedimentary rocks east of the claim area (Helmstaedt *et al.*, 1985; Little, 1985). Granite to granodiorite is in fault contact with or intrudes mafic volcanics in the western claim area.

A regional metamorphic isograd has been mapped that marks the first appearance of cordierite in metasedimentary rocks. The low-grade metamorphic zone defined by this isograd extends from either side of Sito Lake, northeastward through to Clan Lake and Johnston Lake (Fig. 8-58).

CURRENT WORK AND RESULTS

During June 1987, 1:10 000 scale mapping and sampling were carried out over Noranda's claims and adjacent ground. Several altered and mineralised zones were mapped in detail, those on the BELL claims at 1:5000 scale, and those southwest of Sito Lake at 1:1000 or 1:1250 scale. Dighem flew an airborne geophysical survey, which totalled 754 line-km. A ground magnetic and VLF geophysical survey covered 24 line-km.

Pyrite, marcasite, pyrrhotite, arsenopyrite, galena, chalcopyrite and sphalerite, in decreasing order of abundance, are identified on the property. Seven mineralised zones (Fig. 8-58) have strike lengths of at least 100 m, widths of more than 1 m and assays of greater than 1.0 g/t Au. Of these, six are associated with shear zones in metagabbro that may parallel the axial planes of north-northwesterly F_1, northeasterly F_2 and easterly F_3 folds. In these zones the metagabbro is chloritized, carbonatized and silicified and contains quartz stringers. A porphyritic felsic volcanic unit or hypabbysal intrusion commonly occurs within the mineralised shear zones. Examples of these include Zone 1, Del's, Needle Hill, H-Hill and Adam showings. Zone 1, with a strike length of 500 m and widths of 1 to 12 m, gave assays of 98.6 g/t Au over 1 m, 3.1 g/t Au over 3 m, 2.2 g/t Au over 3 m and 2.2 g/t Au over 4 m.

The Gossan Hill - Fuchsite Hill mineralised zone, developed along north-trending silicified shear zones as well as along the felsic-intermediate volcanic contact, assayed 0.095 g/t Au over 0.5 m. Assays of 4.5 g/t Au and 1.6 g/t Au obtained in 1986 could not be duplicated. Anomalous gold assays were also encountered at the Jake showing in the Moberly Lake area, which is a sheared, silicified and sericitized greywacke containing quartz veins, galena and arsenopyrite stringers and pyrite porphyroblasts. Numerous samples were taken from the Bell Lake and BIF Lake iron formations, but gold content was consistently low.

Examination of the assay results of sulfide-bearing rocks also indicated that: mafic-intermediate volcanics yielded higher gold assays than either felsic volcanic or sedimentary rocks and anomalous gold assays are concentrated close to the regional metamorphic isograd in sheared and altered volcanic rocks.

MON

Cominco Ltd.	Gold
2300 - 200 Granville St.	85 J/16
Vancouver, B.C., V6C 2R2	62°54'N, 114°19'W

REFERENCES

Helmstaedt *et al.* (1985); Henderson (1985); Jackson *et al.* (1986c); Lord (1941); Yeo *et al.* (1983).

DIAND assessment report: 082621.

PROPERTY

The Mon property includes 11 mining leases, MON 3-6, 10, 13-15, 17, 20 and the 31 fraction (202.35 ha) and DIS 1, 2 and 5 claims.

LOCATION

MON and DIS claims are 50 km north of Yellowknife and are centred about Discovery Lake (Fig. 8-58).

HISTORY

In 1937 G.A. Moberly and L.W. Nelson discovered visible gold in quartz veins along the contact between a gabbro sill and sedimentary and volcanic rocks and staked the MON claims under a prospecting agreement with Cominco Ltd. Between 1938 and 1939 eleven trenches were cut along strike to intersect the "Main Vein" or "A" zone and a 19.5 m shaft was sunk and 47 m of lateral development were completed. In 1947, 57.3 m of drilling in 3 holes tested the down-dip extension in the vicinity of trenches 1 and 2. This was followed by 1950 drilling of 4 holes for 360.9 m and in 1961 a magnetic survey was run in an unsuccessful attempt to trace the gabbro-sediment/volcanic contact under Discovery Lake. In 1963 detailed geologic mapping and drilling of 10 holes for 488.9 m tested the southern extension of quartz veining. Between 1965 and 1975 approximately 200 t of vein material was mined by open cut from the "A" zone by R. Stevens under lease with Cominco. A small on-site mill produced a gold-bearing sulfide floatation concentrate.

DESCRIPTION

The property is underlain by the Sito Lake volcanic complex (Figs. 8-56, 8-58), a part of the Archean Yellowknife Supergroup comprising mafic and felsic volcanic, sedimentary and mafic-intermediate intrusive rocks (Yeo *et al.*, 1983; Helmstaedt *et al.*, 1985). These are separated from Clan Lake equivalents by a north-trending left lateral strike-slip fault, the Hay-Duck fault extension along the west edge of Sito Lake. The Sito Lake complex is deformed into a major north-northwest-facing open syncline, the Sito Lake fold (Helmstaedt *et al.*, 1985) that plunges steeply to the north. The MON property is on the west limb of the Sito Lake fold. A cordierite isograd transects the eastern part of the MON claims and DIS 1, separating medium-grade rocks to the west from low-grade rocks to the east.

The main MON showing has been described by Lord (1941). The quartz vein system parallels the north-northwest-trending contact between a gabbro sill and sedimentary-volcanic rock but locally the vein or a splay will extend 3 m into the enclosing wedge of volcanic and sedimentary rock. Veins within the system are podiform or lens shaped. Quartz is glassy and varies from white to grey in colour. The vein system has been traced 213 m along strike and by drilling to depths of less than 30 m. Vein width varies from less than 10 cm to about 3 m and averages 0.6 to 0.9 m. Gold content is erratic, ranging from trace up to 274 g/t Au and averages about 34 g/t Au. Quartz veins contain up to 50% ragged, silicified wall rock fragments, which are locally sulfide rich. Quartz veins usually contain less than 1% sulfides and rarely up to 5% sulfides, which are, in decreasing order of abundance, pyrite, pyrrhotite, arsenopyrite, chalcopyrite, galena and sphalerite. Visible gold is common and a correlation is indicated between gold grade and sulfide content.

CURRENT WORK AND RESULTS

In 1986 Troymin Resources Ltd. acquired from Cominco and others an option to purchase the MON property. In January 1987 Troymin drilled 11-holes, 484 m, to test the southern extent of the quartz veining and staked additional claims, DIS 1, 2 and 5, in February 1987. In fall 1987 Coronado Resources Inc. entered into a joint venture agreement with Troymin. Many of the earlier drilled holes stopped short of intersecting the quartz veining and failed to correlate quartz vein lenses. During November-December 1987 12 holes were drilled by Coronado to test strike and dip extensions of the veining. Results of this drilling indicate the Main vein may not have depth continuity, but other mineralised veins were discovered and these remain open both at depth and along strike.

CUR, REBECKA

J.D. Mason	Gold
Yellowknife Gold Mines	85 J/16
321 Bellanca Ave.	62°52'N, 114°15'W
Yellowknife, NWT, X1A 1W8	

REFERENCES

Helmstaedt *et al.* (1985); Henderson (1985).
DIAND assessment reports: 081823, 082618.

PROPERTY

CUR and REBECKA (982.8 ha).

LOCATION

The claims are on the southeast corner of Sito Lake, 50 km north of Yellowknife (Fig. 8-58).

HISTORY

The CUR 1 and 2 claims were recorded in March 1981 and REBECKA in June 1987.

DESCRIPTION

The property is underlain by Burwash Formation greywacke-mudstones, at the north end of the Yellowknife volcanic belt (Henderson, 1985; Helmstaedt *et al.*, 1985). North- to northeast-trending mafic and felsic dykes, up to 6 m wide and tens of metres in length, intrude the metasedimentary rocks. A northeast-trending regional metamorphic isograd transects the claim area, separating low-grade metasediments to the west from medium-grade, cordierite-bearing equivalents to the east (Fig. 8-58).

Highly sheared volcanic rocks along the Yellowknife River mark the northern extension of the Hay-Duck Fault (Fig. 8-58). A small pyritic shear zone in the south-central part of the CUR claim may be a subsidiary shear associated with this fault.

CURRENT WORK AND RESULTS

In September 1987 chip and channel samples were collected from trenches that were excavated over two zones. In Zone 1 silicified greywacke and argillite contain disseminated arsenopyrite and pyrite and are cut by numerous quartz veins and stringers. Arsenopyrite content increases to up to 20% and is locally massive within and near quartz veins. A sample of massive arsenopyrite assayed 18.4 g/t Au over 1.5 m. Gold content throughout the trenches is erratic. Zone 2 consists of silicified metasedimentary rocks intruded by a pink felsic dyke. The dyke contains 1 to 5% combined sulfides and hematite and yielded low gold assays.

WALSH LAKE PROPERTY

Kelmet Resources Ltd.
310, 441 5th Ave. SW
Calgary, Alta., T2P 2V1

Gold
85 J/9
62°37'N, 114°17'W

REFERENCES

Easton and Jackson (1981); Helmstaedt *et al.* (1980); Lord (1941, 1951); Seaton *et al.* (1985, 1987).

DIAND assessment reports: 017330, 017373, 017422, 061422, 080251, 080741, 081393, 081897, 082089, 082508, 082796.

PROPERTY

TING 1,2,4; WAL 1,2,3,10; EQUINOX 1-2; and KELLY 1,2 (2266.3 ha).

LOCATION

The claims are north of Yellowknife and cover Banting, Jackson, and Walsh lakes (Fig. 8-59). The property is accessible by road and boat, via either Vee Lake or by portage from Prosperous Lake.

HISTORY

The area has been explored since the early 1930's. The exploration history of the claims is described by Lord (1941, 1951) and in the various DIAND assessment reports listed under REFERENCES. Parts of the present claims were previously held as the NIB and SAMEX groups. Gold showings discovered in the 1940's in the northern part of the property were trenched and drilled to depths of less than 30 m. Although gold values were confirmed the area has since received only sporadic attention.

The WAL 1-15 claims were recorded by W.J. Humphries in 1974. Four were taken to lease in 1984. The TING and EQUINOX claims were staked by W.J. Humphries in 1983.

In 1985 Kelmet Resources Ltd. optioned the TING, WAL and EQUINOX claims from W.J. Humphries and mapped, prospected and sampled (Seaton *et al.*, 1985). KELLY 1 and 2 were staked in 1985.

DESCRIPTION

Metavolcanic and metasedimentary rocks on the claims form part of the Yellowknife volcanic belt. Volcanics are Banting Group ash and crystal tuffs, tuff breccias and sub-volcanic mafic intrusives and intercalated thin, mafic to intermediate flows and volcaniclastic sediments. Sediments are Walsh Formation argillite, graphitic and pyritic schists and thin-bedded argillaceous greywacke and overlying turbidites (Helmstaedt *et al.*, 1980; Easton and Jackson, 1981). The volcanics and sediments comprise an east-facing north-trending homoclinal succession dipping steeply east. The homocline is separated from the main basic volcanic assemblages of the Yellowknife greenstone belt by major north-trending faults.

Gold showings discovered on the claims are indicated on Figure 8-59. Most of these showings are associated with conformable sulfide-bearing (arsenopyrite, pyrite, chalcopyrite, sphalerite and pyrrhotite) and/or quartz-bearing schist zones, and are developed in four main geological settings:

1. silicified and carbonatized schist within cherty felsic tuffs (Samex, Samex North and Sam Otto showings).
2. silicified and cherty lenses in pyritic sediments (Nib Central showing).
3. stratigraphic transition zones between Banting Formation felsic tuffs and Walsh Formation graphitic and pyritic argillites (Nib North showing).
4. chlorite/sericite schist zones within Walsh Formation argillaceous greywacke (Mispickle Island showing).

CURRENT WORK AND RESULTS

In 1986 the volcanic-sediment interface within the TING, WAL and EQUINOX-1 claims was mapped and showings, gossans, anomalous rusty zones and sulfide-bearing quartz veins were sampled. A total of 225 rock and 12 soil samples were collected and assayed for gold and all analysis over 1000 ppb Au were fire assayed. Gold content ranged from trace to 12.5 g/t Au.

Results from this work indicated that:

1. sulfide minerals, gossan development, silicification and epigenetic quartz veins, stockwork and lenses are developed in several apparently stratigraphically continuous zones.
2. the distribution of anomalous gold concentrations (greater than 50 ppb Au) appears to be stratigraphically controlled.
3. Nib Central, Ting, Mispickle North and Mispickle showings are stratigraphically contiguous and sulfide content and gold tenors may increase in the metasediments towards the south.
4. a stratiform zone of anomalous gold values is found within the felsic volcanics of the Banting Formation.

During February 1987, Taiga Consultants of Calgary were contracted to carry out a magnetic and VLF EM survey (DIAND assessment reports: 082508, 082796). Two grids covering parts of EQUINOX 1-2 were established on the ice and tied into a land grid. The zones of iron-rich pelites, which are exposed on land along the volcanic-sediment interface, were defined by magnetic and EM surveys and these were extended from the Mispickle showing southward under Walsh Lake. During summer 1987 the remainder of the north half of the property was mapped at 1:5000 scale and 700 soil samples were collected for gold and arsenic assay.

PRO CLAIMS

Nathan Minerals Inc.
18, 10509 81 Ave.
Edmonton, Alta., T6E 1X7

Gold
85 J/8,9
62°34'N, 114°15'W

REFERENCES

Baragar (1961); Easton and Jackson (1981); Helmstaedt and Padgham (1986); Helmstaedt *et al.* (1980); Jolliffe (1938); Lord (1941, 1951); McGlynn (1971); Seaton *et al.* (1987).

DIAND assessment reports: 081835, 082040, 082152, 082602.

PROPERTY

PRO 2-11 (5260.5 ha).

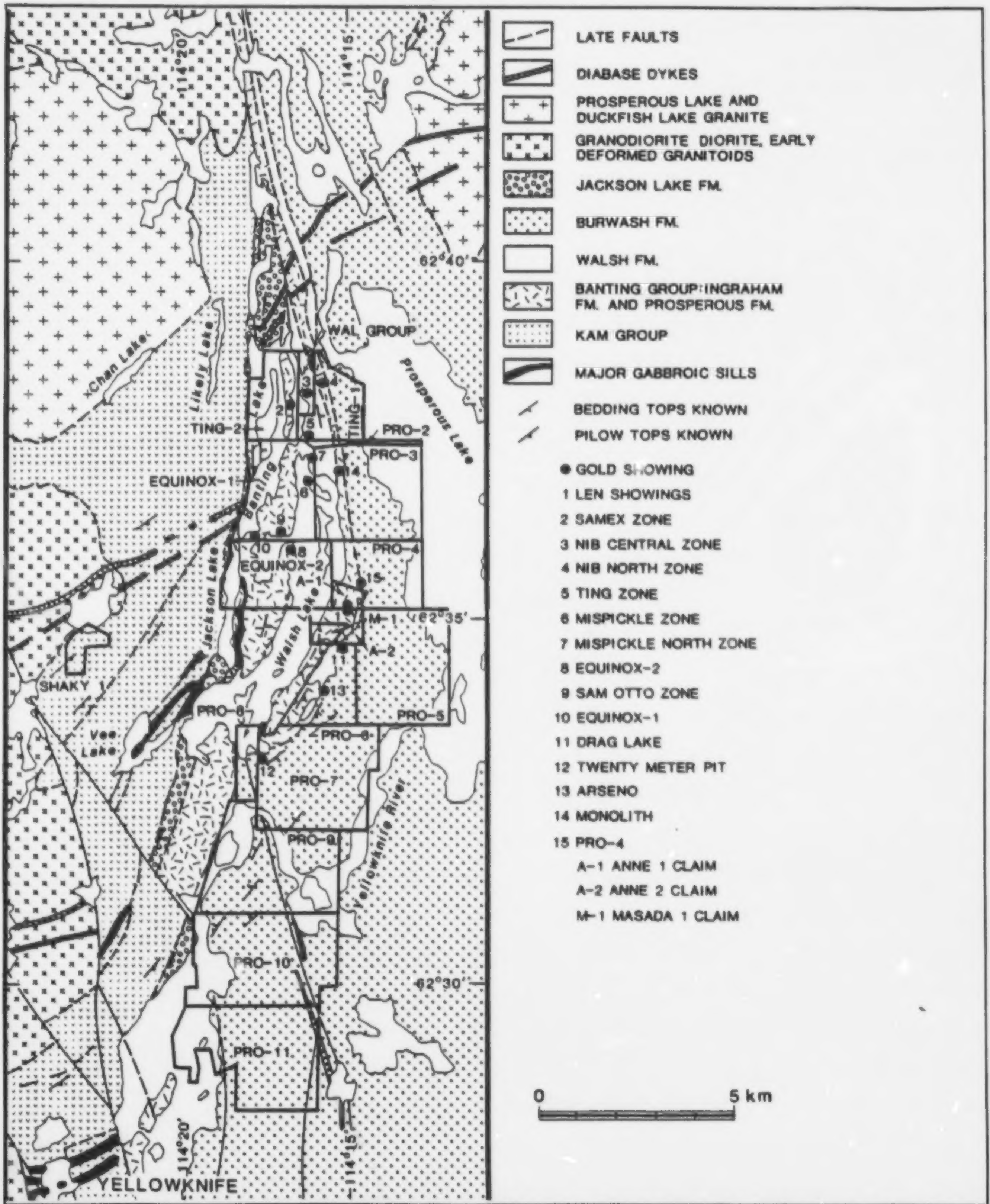
LATE FAULTS
DIABASE DYKES
PROSPEROUS LAKE AND DUCKFISH LAKE GRANITE
GRANODIORITE DIORITE, EARLY DEFORMED GRANITOIDS
JACKSON LAKE FM.
BURWASH FM.
WALSH FM.
BANTING GROUP: INGRAHAM FM. AND PROSPEROUS FM.
KAM GROUP
MAJOR GABBROIC SILLS
BEDDING TOPS KNOWN
PILOW TOPS KNOWN
● GOLD SHOWING
1 LEN SHOWINGS
2 SAMEX ZONE
3 NIB CENTRAL ZONE
4 NIB NORTH ZONE
5 TING ZONE
6 MISPICKLE ZONE
7 MISPICKLE NORTH ZONE
8 EQUINOX-2
9 SAM OTTO ZONE
10 EQUINOX-1
11 DRAG LAKE
12 TWENTY METER PIT
13 ARSENO
14 MONOLITH
15 PRO-4
A-1 ANNE 1 CLAIM
A-2 ANNE 2 CLAIM
M-1 MASADA 1 CLAIM
0
5 km
114°20'
114°15'
62°40'
62°35'
62°30'
Chan Lake
Likely Lake
Banting Lake
Jackson Lake
Walsh Lake
Prosperous Lake
Yellowknife River
Vee Lake
WAL GROUP
TING-1
TING-2
PRO-2
PRO-3
PRO-4
PRO-5
PRO-6
PRO-7
PRO-8
PRO-9
PRO-10
PRO-11
EQUINOX-1
EQUINOX-2
A-1
A-2
M-1
SHAKY
YELLOWKNIFE

FIGURE 8-59: Geology, showings and claims in the Walsh Lake area (modified after Helmstaedt and Padgham, 1986).

LOCATION

The property covers the area between Walsh Lake and Prosperous Lake, extending from north of Burwash Point on Yellowknife Bay, to near the north end of Prosperous Lake, about 19 km north of Yellowknife (Fig. 8-59).

HISTORY

The history of exploration in the claims area is described by Baragar (1961), Jolliffe (1938), Lord (1941, 1951), McGlynn (1971) and in DIAND assessment reports listed under REFERENCES. An extensive gossan in the northwest corner of PRO 7 was staked as the BELL-MURPHY group in 1928. It was staked again as the LEN group in 1957 and a shallow trench excavated by the previous owners, now known as the Twenty Metre Pit, was deepened to 2.4 m. Four samples collected by Baragar (1961) yielded assays of trace to 0.17 ppm Au. Noranda restaked the gossan in 1977 as the LAW claims. PRO 3-7 were recorded in May of 1983, PRO 8 was added in August 1984 and PRO 9-10 and PRO 11 were recorded in May and August 1986, respectively. PRO 2 was recorded in September 1987.

Work carried out on PRO 3-8 (DIAND assessment reports: 081835, 082040) during 1984 and 1985 is summarised in Seaton *et al.* (1987).

DESCRIPTION

The claims are underlain by Banting Group felsic to intermediate volcanic rocks and Duncan Lake Group sedimentary rocks and intercalated volcanic rocks of the Yellowknife volcanic belt (Fig. 8-59; Helmstaedt and Padgham, 1986). Considerable amounts of sulfides were noted by Helmstaedt *et al.* (1980) along the volcanic-sediment contact, which is marked by interbedded volcanics and argillite.

CURRENT WORK AND RESULTS

During 1986 and 1987 geological mapping at 1:4000 scale, rock sampling and biogeochemical surveying, which included analysis of humus and labrador tea twigs, was completed.

Results from this work include:

1. The zone of sulfide mineralisation near the Prosperous-Burwash formation contact, observed in 1985, extends through PRO 3 and 4 claims (Fig. 8-59). Samples collected along this zone contained up to 8100 ppm As and from 59 to 907 ppb Au.
2. A small pit about 50 m east of the Arseno showing (Fig. 8-59) contains an arsenopyrite-bearing quartz vein which assayed 24 ppb Au over 2.5 m. Rusty metasediments about 150 m to the south of this pit assayed 158 ppb Au over 5 m.
3. Samples from the Drag Lake (Fig. 8-59) showing assayed up to 2.5 g/t Au. Samples from other arsenopyrite showings within quartz veins assayed up to 1.6 g/t Au.
4. Some samples of tuffaceous slates within the Prosperous Formation near the southeast end of Walsh Lake are anomalous in Au and As.
5. Background concentrations of platinum, palladium and gold are present in the Duck Lake Sill.
6. Chip samples of quartz veins in Walsh Formation argillites, from a pit on an island near the north end of Walsh Lake, yielded 459 ppb Au, 10 000 ppm As and 174 ppm Cu.

ANNE CLAIMS

Richard Zabolotny	Gold
P.O. Box 1953	85 J/09
Yellowknife, NWT, X1A 2P5	62°35'N, 114°15'W

REFERENCES

Baragar (1961); Easton and Jackson (1981); Helmstaedt *et al.* (1980).

DIAND assessment reports: 081375, 081642, 082072.

PROPERTY

ANNE 1-2 (157 ha).

LOCATION

The claims are roughly 16 km north of Yellowknife on the east shore of Walsh Lake and west of the PRO claims (Fig. 8-59).

HISTORY

In 1961, the property was held by Fred Lypka and Len Peckham as the LEN group (Baragar, 1961). Three trenches were excavated in 1980-82 (DIAND assessment reports: 081375, 081642). ANNE 1-2 were recorded in August, 1984.

DESCRIPTION

The claims cover the northerly trending contact between intermediate to felsic volcanics of the Banting Group to the west and metaturbidites of the Burwash Formation to the east (Fig. 8-59; Easton and Jackson, 1981; Helmstaedt *et al.*, 1980).

CURRENT WORK

Work done in 1985 is described here because it was filed after the publication of the 1984-85 Mineral Industry Report. In 1985 one day was spent evaluating the property. Samples collected from existing pits and trenches were examined under the binocular microscope and described. Four samples collected from four pits were assayed for gold and silver. The best assay was 6.9 ppm Au and 7.5 ppm Ag. The property was optioned to Nathan Minerals in 1987.

MASADA 1

Roger Windle	Gold
Box 2905	85 J/9
Yellowknife, NWT, X1A 2R2	62°33'N, 114°15'W

REFERENCES

Easton and Jackson (1981); Helmstaedt *et al.* (1980); Helmstaedt and Padgham (1986).

DIAND assessment reports: 082072, 082490.

PROPERTY

MASADA 1.

LOCATION

MASADA 1 is on the east shore of Walsh Lake, south of the ANNE claims, about 13 km north of Yellowknife (Fig. 8-59).

HISTORY

The property was part of the ANNE claim group (DIAND assessment report 082072).

DESCRIPTION

The claim is underlain by upper Banting Group felsic to intermediate volcanics of the Archean Yellowknife Supergroup; to the east are sedimentary rocks of the Burwash Formation (Helmstaedt and Padgham, 1986).

CURRENT WORK AND RESULTS

In June 1987 two trenches were blasted in the northwest corner of the claim. Two samples assayed 2 and 14 ppb Au.

SHAKY 1

J.B. MacAlister	Gold
P.O. Box 322	85 J/9
Fort Langley, B.C., V0J 1J0	62°35'N, 114°22'W

REFERENCES

Helmstaedt and Padgham (1986); Henderson (1985); Henderson and Brown (1966); Seaton (1983).

DIAND assessment report: 082505.

PROPERTY

SHAKY 1.

LOCATION

The claim is on the south shore of Ryan Lake, about 13 km north of Yellowknife (Fig. 8-59).

HISTORY

The property covers ground that originally was part of the ANN 1-10 claims, staked by D. Nickerson in 1971 (Seaton, 1983). In the southern part of these claims a northeast-trending shear zone up to 1.5 m in width was mapped. A quartz vein less than 13 cm wide in this shear zone yielded erratic but locally high gold assays. In 1984, 14 t of material was mined from this vein and treated at Con Mine. The grade of this test was 37.3 g/t Au.

DESCRIPTION

The claim is underlain by Kam Group basalts of the Yellowknife volcanic belt (Helmstaedt and Padgham, 1986; Henderson and Brown, 1966). To the west of the claims the volcanic rocks are intruded by the Western Granodiorite.

CURRENT WORK AND RESULTS

During September 19-21, 1987, 32 rotary holes were drilled, totalling 9.8 m. Drill cuttings were panned and 4 composite samples were assayed. Assays ranged from 2 to 116 ppb Au.

MARLIN CLAIMS

Golden Marlin Resources Ltd.	Gold
Suite 300, 133 3rd Ave. N	85 J/1,7,8
Saskatoon, Sask., S7K 2H4	62°18'N, 114°28'W

REFERENCES

Baragar (1966); Boyle (1961); Gibb and Thomas (1980); Helmstaedt *et al.* (1979); Helmstaedt and Padgham (1986); Henderson (1970, 1975b, 1976, 1978); Henderson and Brown (1966); Jolliffe (1942, 1946); Relf and Nicholson (1986); Seaton (1983a); Seaton *et al.* (1987); Seaton and Hurdle (1978).

DIAND assessment reports: 082491, 082492, 082493, 082404, 082496, 082506, 082613, 081871, 081872, 081873.

PROPERTY

MARLIN 1-34.

LOCATION

The claims are 10 to 25 km south of Yellowknife and cover much of the outer part of Yellowknife Bay, including the West Mirage and many of the East Mirage islands.

HISTORY

The northern part of the Marlin claim block was, in part, previously staked as the YT group, the history of which is summarised in Seaton (1983a) and Seaton and Hurdle (1978). MARLIN 1-10 were recorded in 1982 and MARLIN 14-28 and 29-31 were added in 1984 and 1985. During 1984, work included geological mapping, prospecting, sampling, including underwater sampling using scuba equipment, and marine surveying. Gold showings were discovered. In 1985, work comprised an IP survey over lake ice, overburden drilling, additional water-borne seismic surveying, aerial photography and a helicopter-borne magnetic and VLF EM survey.

DESCRIPTION

The MARLIN claims cover an area of Great Slave Lake at the mouth of Yellowknife Bay where the islands represent the southern limit of outcrop of the Yellowknife volcanic belt (Helmstaedt *et al.*, 1979; Relf and Nicholson, 1986a,b).

CURRENT WORK AND RESULTS

During 1986 and 1987, 615.5 km of seismic surveys at 50 m line spacing were completed to help delineate shear structures including the southern extension of the Campbell shear zone and the West Bay Fault. Prospecting on the land parts of claims included panning for gold and recording the corresponding colours. Samples from each panning site were taken and assayed for gold and silver.

BRANDY, MONTE, LOIS, KEN and JOON Claims

Golden Exodus Ventures Ltd.
600, 890 W. Pender St.
Vancouver, B.C., V6C 1K4

Gold
85 I/7
62°25'N, 112°55'W

REFERENCES

Lord (1951); Seaton *et al.* (1987).

DIAND assessment reports: 082086, 062263, 062175, 060059, 081798, 081830, 082087.

PROPERTY

MONTE 4-6, BRANDY 1, LOIS 1-2, KEN 1, JOON 2.

LOCATION

The claims are near Strike Lake, 80 km east of Yellowknife.

HISTORY

Ground staked in 1939 as the NORMA 1-12 claims is covered now by BRANDY 1. The history of the NORMA claim group is covered in detail by Seaton *et al.* (1987). JOON 2 was staked in 1939 for Consolidated Mining and Smelting. Diamond drilling was done in 1941, 1956 and 1973. In 1977 and 1978, Strike Lake Resources Ltd. optioned the JOON 2 claim from D. Nickerson and conducted trenching and bulk sampling. Bulk sample grades averaged 171.4 g/t Au. The JOON 2 claim was optioned to Robertson Investments Ltd. from D. Nickerson in 1980 and 20 t of material were shipped to Vancouver for milling and metallurgical testing. In 1984, two holes were drilled on BRANDY 1 to confirm grades reported by Beaulieu Yellowknife Mines Ltd. in the mid-1940's.

DESCRIPTION

The claims are underlain by Burwash Formation, greenschist-grade, thinly to thickly bedded metaturbidites that are intricately folded. The auriferous grey-white quartz veins are parallel to bedding and are concomitantly folded. The Norma Vein, on BRANDY 1 claim, is described in detail by Lord (1951).

CURRENT WORK AND RESULTS

In 1985 Taiga Consultants Ltd. on behalf of Genesis Resources Corporation (now Golden Exodus Ventures Ltd.) prospected the claims. Existing trenches were mapped at 1:250 and chip sampled. Assays ranged from 11.04 to 256.63 g/t Au and 15.86 to 32.66 g/t Ag, over narrow widths. Soil geochemical, magnetometer and VLF EM surveys were conducted over four separate flag-and-compass grids. Three anomalous gold assays were recorded. The VLF EM survey delineated 4 conductors, one of which corresponded to a magnetic low and the magnetometer survey defined a number of narrow magnetic zones.

JPAG 1-3 CLAIMS

Goldbrook Explorations Inc.
500, 67 Richmond St. W
Toronto, Ont., M5H 1Z5

Gold
85 I/4
62°10'N, 113°50'W

REFERENCES

Henderson (1985); Padgham *et al.* (1976).

DIAND assessment report: 082180.

PROPERTY

JPAG 1-3.

LOCATION

The claims cover the Benign Islands in the North Arm of Great Slave Lake, 42 km west of Yellowknife.

HISTORY

Early work is not recorded. In 1962, Giant Yellowknife Mines Ltd. mapped and sampled trenches in quartz-gold veins on the islands. Terra Mining and Exploration Ltd. staked the BEN 1 claim in 1969 and explored by trenching. In 1973, the BEN 2-9 claims were added and 2 holes were drilled for 43 m to test a quartz vein system (Padgham *et al.*, 1976). The BEN claims had all lapsed by 1979. The JPAG 1-3 were staked in 1986.

DESCRIPTION

The claims are underlain by steeply northeast-dipping metaturbidites of the Burwash Formation.

CURRENT WORK AND RESULTS

A 50 km grid was established over the showings on the property and magnetic and VLF EM surveys were completed.

RAND Claims

BHP-Utah Mines Ltd.
1600 - 1050 W. Pender St.
Vancouver, B.C., V6E 3S7

Gold
85 J/8
62°27'N, 114°05'W

REFERENCES

Henderson (1985); Jolliffe (1942).

DIAND assessment report: 082363.

PROPERTY

RAND 1-5.

LOCATION

The property is centred on Preg Lake, 13 km east of Yellowknife.

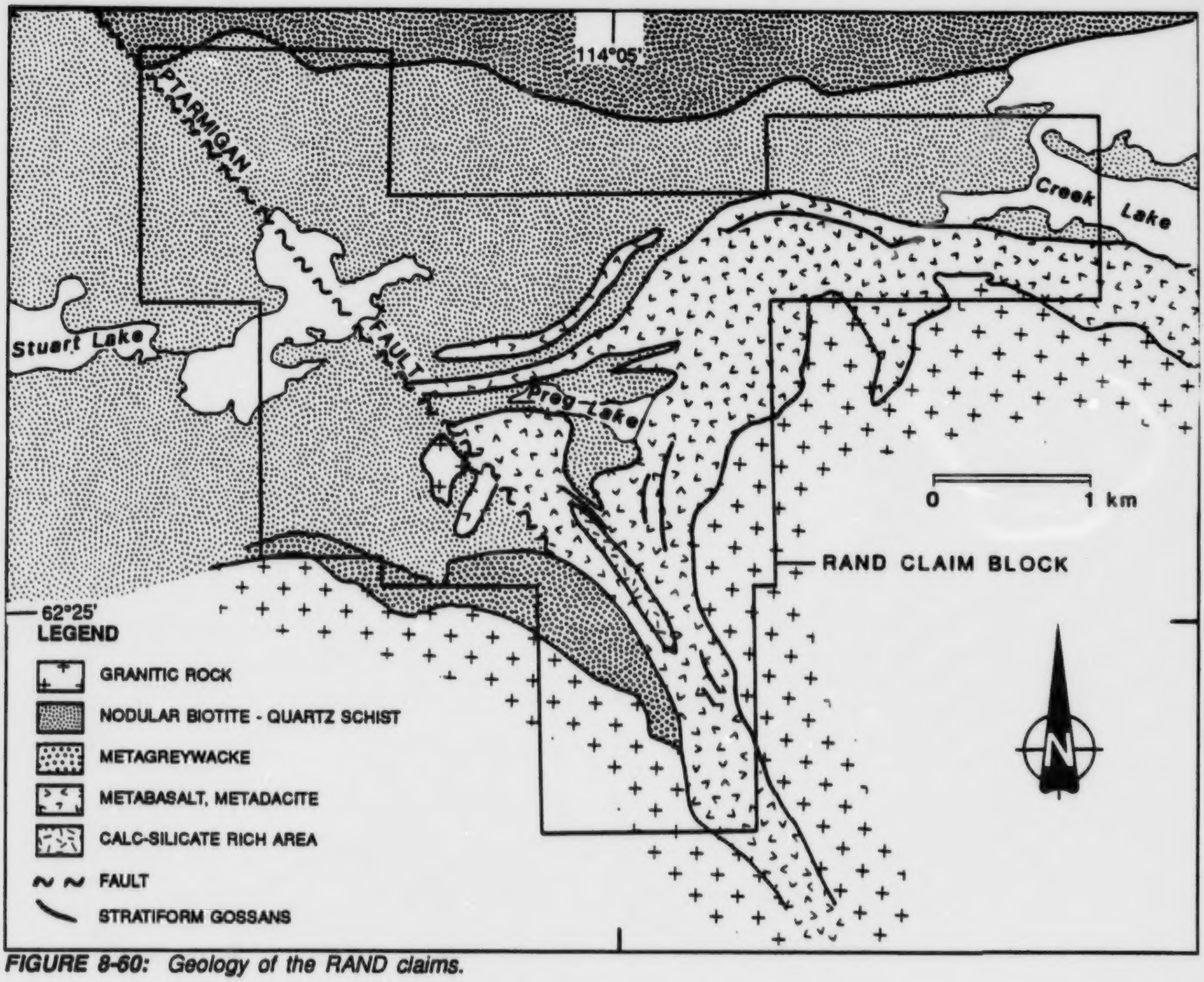
114°05'
PTARMIGAN FAULT
Stuart Lake
Creek Lake
Frog Lake
0
1 km
RAND CLAIM BLOCK
62°25'
LEGEND
GRANITIC ROCK
NODULAR BIOTITE - QUARTZ SCHIST
METAGREYWACKE
METABASALT, METADACITE
CALC-SILICATE RICH AREA
FAULT
STRATIFORM GOSSANS
N

FIGURE 8-60: Geology of the RAND claims.

HISTORY

Previous exploration is evidenced by claim posts, pits, trenches and X-ray drill core; however, no assessment work was filed. RAND 1 was staked on August 31, 1985, and RAND 2-5 were added in December, 1985.

DESCRIPTION

The RAND claims cover the western part of a 10 km by 1 km arcuate belt of Archean mafic flows, the Duck Formation, part of the Yellowknife Supergroup, paralleling the contact with a granodioritic pluton to the south and east (Figs. 8-56, 8-60; Henderson, 1985). The metavolcanics are conformably overlain to the north by greenschist- to amphibolite-grade greywacke and argillite of the Burwash Formation (Henderson, 1985). Quartz-feldspar porphyry dykes, diabase dykes and quartz veins cut all lithologies. There are several northwest-trending, steep-dipping faults, including the Ptarmigan Fault, on the property.

CURRENT WORK AND RESULTS

Field work in 1986 included 1:5000 scale geological mapping, rock-chip sampling, and ground VLF EM and magnetometer surveying along a cut and chained grid with cross-lines at 100 m or 200 m intervals.

Several stratiform, siliceous, amphibolitic gossanous zones with pyrrhotite, pyrite and chalcopyrite in the volcanics were traced for 200 m to 800 m (Fig. 8-60). Most have VLF EM and/or magnetic signatures which reflect the coincidence of shearing and pyrrhotite. No samples assayed were anomalous in gold, although some contain arsenic, tungsten and base metal anomalies. An extensive zone of calcsilicate enrichment in the mafic volcanics is strongly anomalous in arsenic and sporadically anomalous in tungsten (Fig. 8-60). Rock chip samples of quartz veins assayed up to 1750 ppb Au.

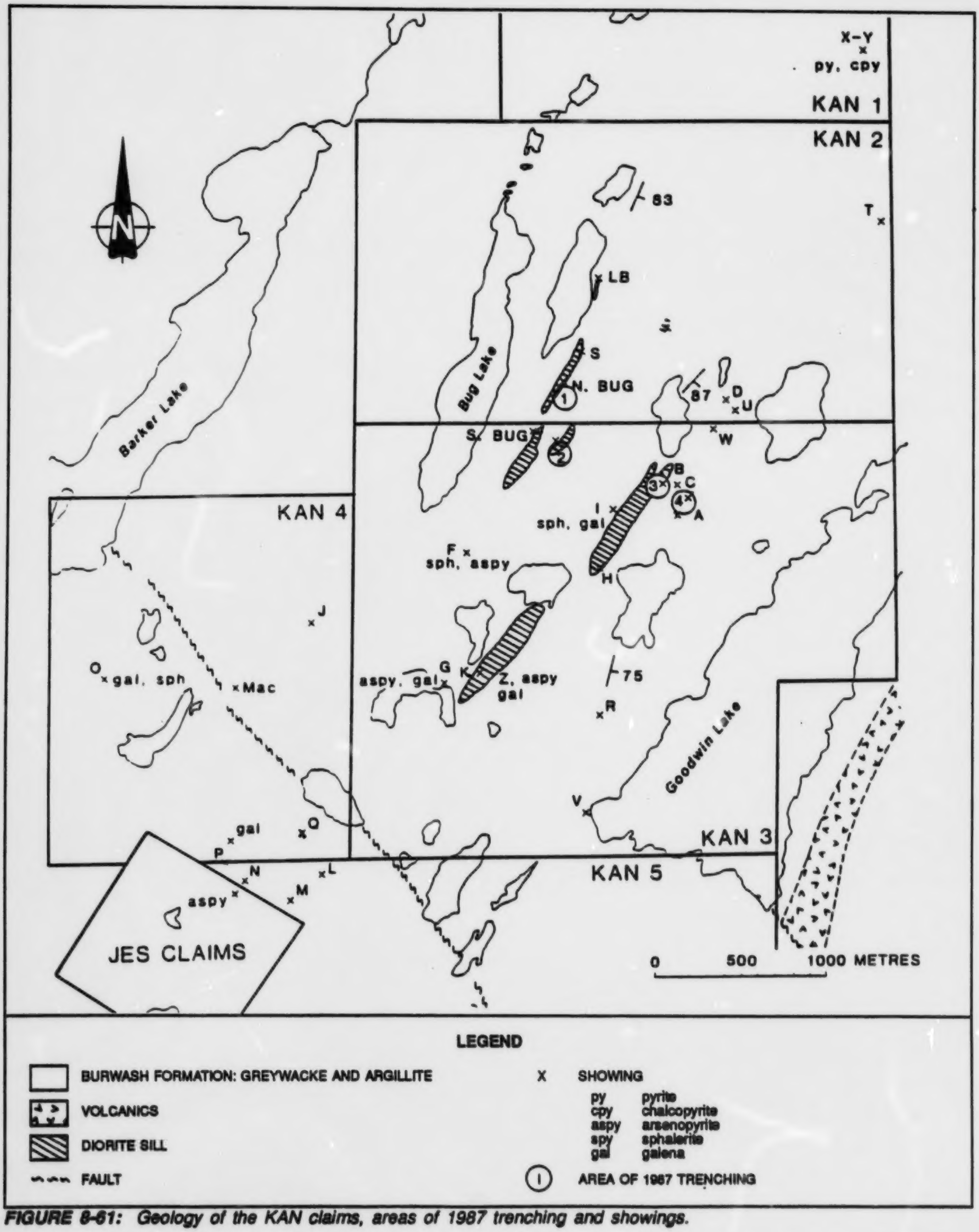
X–Y
py, cpy
KAN 1
KAN 2
N
83
T
LB
Bug Lake
Barker Lake
S
N. BUG
1
87
D
U
S. BUG
2
W
B
3
C
4
A
I
sph, gal
F
sph, aspy
H
KAN 4
J
O
gal, sph
Mac
G
aspy, gal
K
Z, aspy
gal
75
R
Goodwin Lake
V
KAN 3
KAN 5
gal
P
Q
N
L
M
aspy
JES CLAIMS
0
500
1000 METRES
LEGEND
BURWASH FORMATION: GREYWACKE AND ARGILLITE
VOLCANICS
DIORITE SILL
FAULT
X SHOWING
py pyrite
cpy chalcopyrite
aspy arsenopyrite
spy sphalerite
gal galena
1 AREA OF 1987 TRENCHING

FIGURE 8-61: Geology of the KAN claims, areas of 1987 trenching and showings.

KAN 1-5

Kansai Mining Corp.
1110 - 625 Howe St.
Vancouver, B.C., V6C 2T6

Gold
85 O/1
114°07'N, 63°03'W

REFERENCES

Lord (1951); Seaton (1984); Thorpe (1966, 1972); Tremblay (1952).

DIAND assessment report: 082852.

PROPERTY

KAN 1-5.

LOCATION

The claims are north of Johnson Lake, 67 km north of Yellowknife, 25 km southwest of Discovery Mine.

HISTORY

Exploration in the area dates back to the 1930's. In 1938 the ground was held as the BON, TON and ALP claim groups and trenching was completed on a mineralised diorite sill. Production is reported in 1938 or 1939 from the adjacent J.E.S. claims (Fig. 8-61; Seaton, 1984). The property was restaked as the CAR and KEL groups in 1944 and following discovery of the Discovery mine, prospecting, trenching and small core drilling were completed between 1945-1947 on the BUG group. During 1981 underground exploration was completed on the Main or Cross vein on the J.E.S. claims adjoining KAN 4. The KAN 1-5 were staked in 1987.

DESCRIPTION

North- to northeast-striking, isoclinally folded, massive siliceous to argillaceous greywackes and minor argillites of the Burwash Formation are intruded by quartz-diorite sills. Several quartz veins contain anomalous gold concentrations and associated minerals include arsenopyrite, pyrrhotite, pyrite, galena and sphalerite. The largest sill, up to 150 m wide with a 2 km strike length, is cross-cut by mineralised quartz veins in tension gashes, locally at its contact with sediments, and in local stockworks. Quartz veins contain disseminated pyrrhotite and arsenopyrite with minor pyrite and galena and gold.

CURRENT WORK

Ten trenches were excavated in four areas (Fig. 8-61) to test quartz veins in diorite sills and sediments. Thirty six grab and channel samples were collected for assay. Samples from new trenches on the North Bug showing assayed from 1 to 4.9 g/t Au. The best assay, 27.8 g/t Au, came from a grab sample on the F showing.

NICHOLAS LAKE

Chevron Minerals Ltd.
1900 - 1055 W. Hastings St.
Vancouver, B.C., V6E 2E9

Gold
85 P/4,5
63°15'N, 113°45'W

REFERENCES

Moore *et al.* (1951); Tremblay (1952).

DIAND assessment report: 062301, 060410, 082655.

PROPERTY

NIC 1 and 2.

LOCATION

The claims are 88 km north-northeast of Yellowknife and the main showing is on the north side of Nicholas Lake, 10 km north of Discovery mine (Fig. 8-56).

HISTORY

A mineralised vein system cross-cutting metasediments was discovered in 1941 and staked as the BENCH claims. Cominco blasted 14 trenches in 1941 and drilled 10 X-ray holes in 1947. These claims lapsed in 1952. The area was restaked in the late 1950's as the DOT 1-6 group by Archie Mandeville, then as the Bag 1-6 by Fred Lypka in the 1960's, and as the GAB 1-6 group by Robert Olexin in the 1970's. Seven trenches were blasted by these owners.

The main showing area was staked in 1986 as the NIC 1 claim (129 ha) by David Webb, and together with the adjoining NIC 2 claim, was optioned by him to Chevron Minerals Ltd. in April 1987.

DESCRIPTION

Burwash Formation of the Archean Yellowknife Supergroup comprises thinly to thickly bedded greywacke turbidites with cordierite porphyroblasts replacing the more argillaceous layers. These are intruded by granitic bodies (Fig. 8-62). The main showing is within a 300 m by 150 m foliated biotite granodiorite plug near the contact with sediments.

The main showing, a zone of sulphide-bearing quartz veins, is exposed over a width of 5 m and a length of 160 m. The zone is sinuous with a 130° strike. Sulphides are arsenopyrite, pyrite, chalcopyrite, sphalerite, galena and pyrrhotite. Quartz may be glassy, cherty or sugary. Gold is associated with the latter two.

CURRENT WORK AND RESULTS

Three days were spent in geological mapping at 1:10 000. The vein system was mapped at 1:500 along a cut and flagged grid. The 15 old and 4 new trenches were mapped at 1:20 or 1:25 and chip sampled. This was followed by stripping, mapping at 1:250, and additional chip sampling (Fig. 8-63).

HEATHER, PETE, BILL AND RON CLAIMS, SPARTA VEIN (TINKER LEASE) and GAB PROPERTY

Treminco Resources
110 - 625 Howe St.
Vancouver, B.C., V6C 2T6

Gold
85 P/3,4
63°05'N, 113°30'W

REFERENCES

Henderson (1941); Lord (1951); Padgham (1985).

DIAND assessment reports: 060410, 082647.

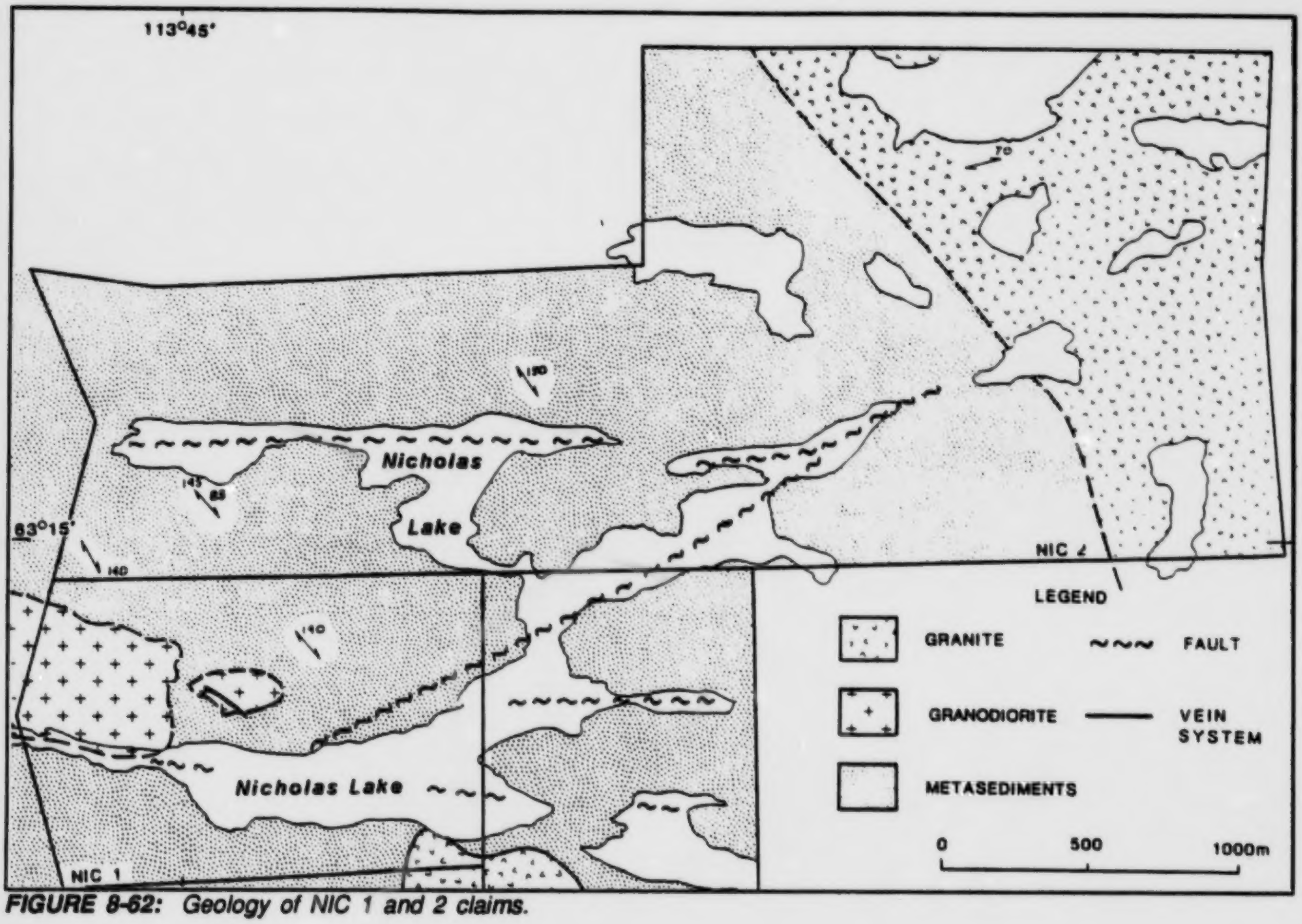

FIGURE 8-62: Geology of NIC 1 and 2 claims.

PROPERTY

HEATHER 1, HEATHER 2, PETE 1, BILL 1, RON 1, TINKER and GAB leases.

LOCATION

The property is 80 km northeast of Yellowknife on Cross and Mac lakes between Gordon and Thistlethwaite lakes.

HISTORY

The Sparta vein was first staked in 1945. Trenching and diamond drilling for 3046 m of core in 76 holes was completed in 1946. In 1947 gold was discovered on the GAB property and drilling, totalling 396 m in 41 holes, was completed. Drilling has defined a 60 m length of vein averaging 19.89 g/t Au (uncut) across 1.2 m to a maximum depth of 23 m. Holes intersecting the vein at depths of 29 to 40 m returned low gold assays. Drilling on a small island in Cross Lake, to test the western extension of the vein, also returned low gold assays. The leases are currently under option to Treminco Resources Ltd. who staked adjacent claims in 1986 (Fig. 8-64).

DESCRIPTION

The property is underlain by Burwash Formation interbedded greywacke, shale arkose and quartzite metamorphosed to knotted quartz-mica schist and hornfels. Some knots include mica and chiastolite aggregates. The rocks have been folded into widely spaced recumbent folds with 35°-75° east- and northeast-dipping axial planes (Fig. 8-64).

CURRENT WORK AND RESULTS

In 1986-87 Treminco began an evaluation of the GAB showing which included, in January and February 1987, 877 m of drilling in 27 holes. Gold-bearing quartz veins are in contorted and drag-folded slate beds sandwiched between more massive metasedimentary beds. The quartz veins may contain sparse pyrite, pyrrhotite, arsenopyrite, chalcopyrite, sphalerite and galena.

In 1987, 30 man days were spent outlining the outcrop of the contorted slate, collecting 27 samples for assay, mapping the Sparta vein at 1:2000 and examining old drill core and showings, including trenches both north and south of Mac Lake.

Treminco estimate the Gab vein contains 10 900 t of 13.7 g/t Au and reports a previous estimate for the Sparta vein of 2720 t of 12.3 g/t Au.

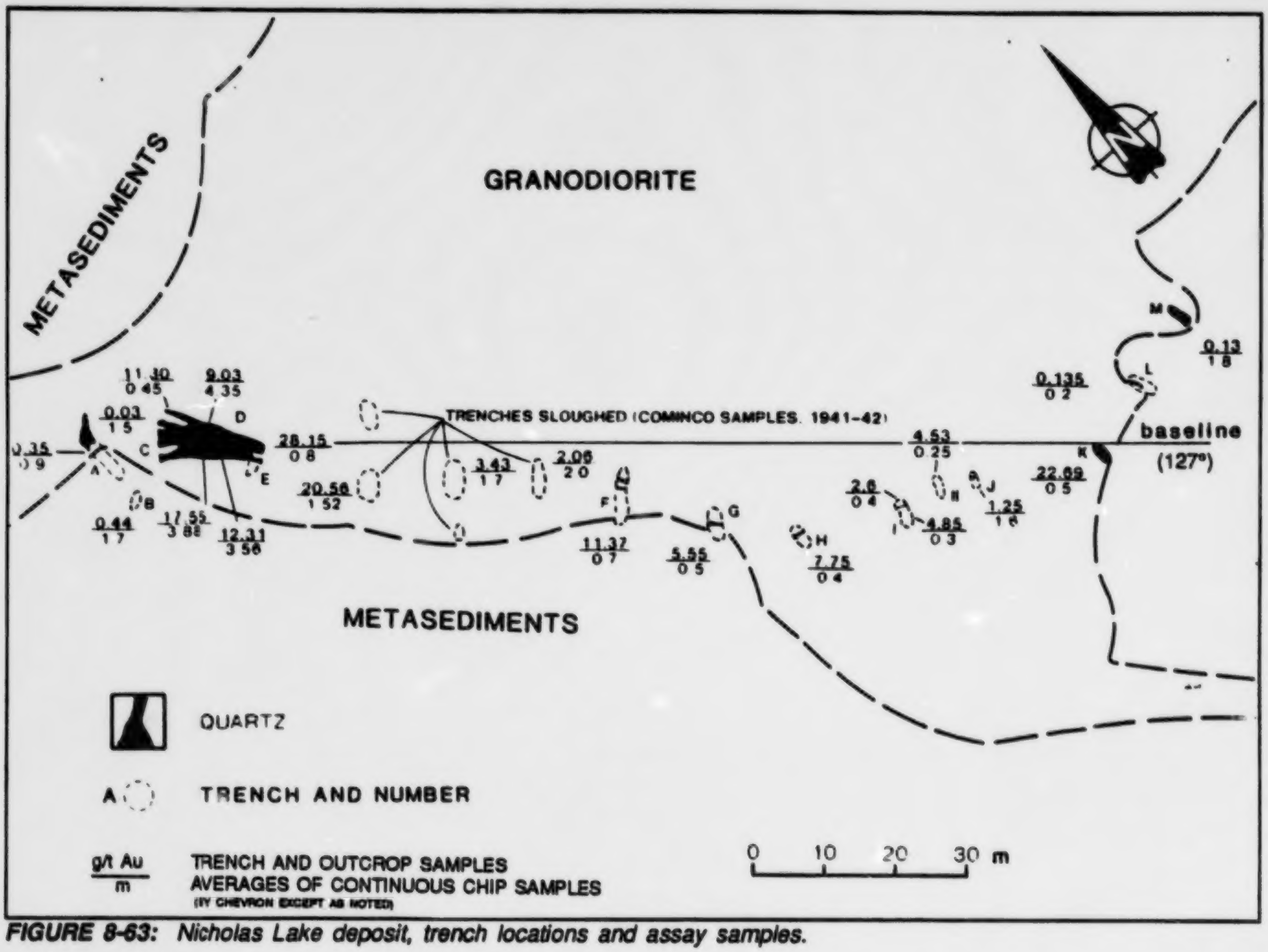
GRANODIORITE
METASEDIMENTS
METASEDIMENTS
TRENCHES SLOUGHED (COMINCO SAMPLES. 1941-42)
baseline
(127°)
A
B
C
D
E
F
G
H
I
J
K
L
M
0.35 / 0.9
11.30 / 0.45
9.03 / 4.35
0.03 / 1.5
28.15 / 0.8
20.56 / 1.52
3.43 / 1.7
2.06 / 2.0
0.44 / 1.7
17.55 / 3.88
12.31 / 3.56
11.37 / 0.7
5.55 / 0.5
7.75 / 0.4
2.6 / 0.4
4.53 / 0.25
4.85 / 0.3
1.25 / 1.6
22.69 / 0.5
0.135 / 0.2
0.13 / 1.8
QUARTZ
A
TRENCH AND NUMBER
g/t Au / m
TRENCH AND OUTCROP SAMPLES
AVERAGES OF CONTINUOUS CHIP SAMPLES
(BY CHEVRON EXCEPT AS NOTED)
0
10
20
30 m

FIGURE 8-63: Nicholas Lake deposit, trench locations and assay samples.

MAHE PROPERTY

Giant Bay Resources Ltd.
440 - 808 W. Hastings St.
Vancouver, B.C., V6B 1N6

Gold
85 I/14
62°58'N, 113°19'W

REFERENCES

Henderson (1941); Henderson (1985); Stokes *et al.* (1988, 1989).

DIAND assessment reports: 081644, 081652, 081690, 082129.

PROPERTY

MAHE, MAHE 1-2, AR, AR1, BEAR, AD, POL claims and the LYNK 1-4 lease totalling 1720.3 ha.

LOCATION

The property is on the south west shore of Gordon Lake, north of Knight Bay. It adjoins the Camlaren Mine claims to the east (Fig. 8-65) and is 80 km north-northeast of Yellowknife.

HISTORY

The ground was staked in 1937 and prospected in 1938-44. Extensive surface work, including trenching, sampling and X-ray drilling was carried out by various companies including Sentinel Mines Ltd. The claims lapsed in 1947. MAHE was staked in 1978, AR and BEAR in 1981 and MAHE 1 and 2, POL, AR1 and AD in 1983. In 1981, the vein on the MAHE claim was tested by drilling 46 1 m holes in 26 trenches. Assays ranged from trace to 32.64 g/t Au (DIAND assessment report 081644). In 1982 another vein on the BEAR was tested by 70 1 m holes; the best assay was 1.37 g/t Au (DIAND assessment report 081652).

In 1983 Giant Bay Resources Ltd. acquired majority interest in the claim group. To investigate the gold-bearing quartz-breccia systems, during July to October 1983, Giant Bay gridded, mapped, prospected, blasted and sampled using a plugger at 255 sites for 182 m of core and between Sentinel and Gordon lakes and on MAHE drilled 9 BQ-size drill holes from 7 setups for 852 m of core (DIAND assessment report 082129). Drilling continued in 1984 with an additional 25 holes for 498.7 m of core which outlined a geologic reserve for the Kidney Pond zone of 500 000 t grading 5 g/t Au over an

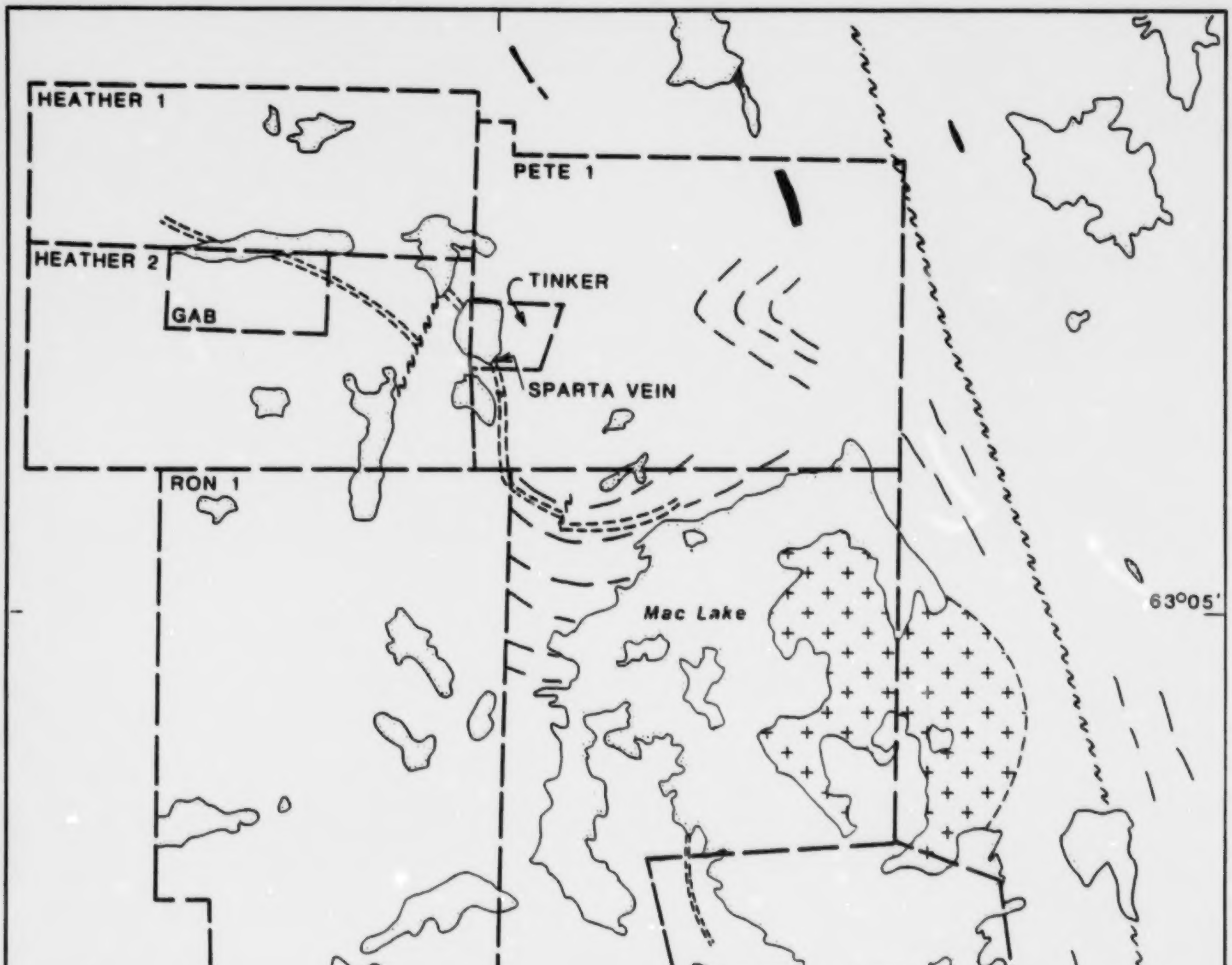
HEATHER 1
HEATHER 2
GAB
PETE 1
TINKER
SPARTA VEIN
RON 1
Mac Lake
63°05'
BILL 1
TRY ME
0
1000 m
SCALE
113°30'
LEGEND
DIABASE DYKE
GRANITE
YELLOWKNIFE SUPERGROUP METASEDIMENTS INCLUDING SLATE LOCALLY HOSTING GOLD BEARING QUARTZ VEINS
CONTORTED
FAULT
TREND OF BEDDING (FROM AIR PHOTOGRAPHS)

***FIGURE 8-64:** Geology of HEATHER, PETE, BILL, GAB, TINKER and TRY ME claims.*

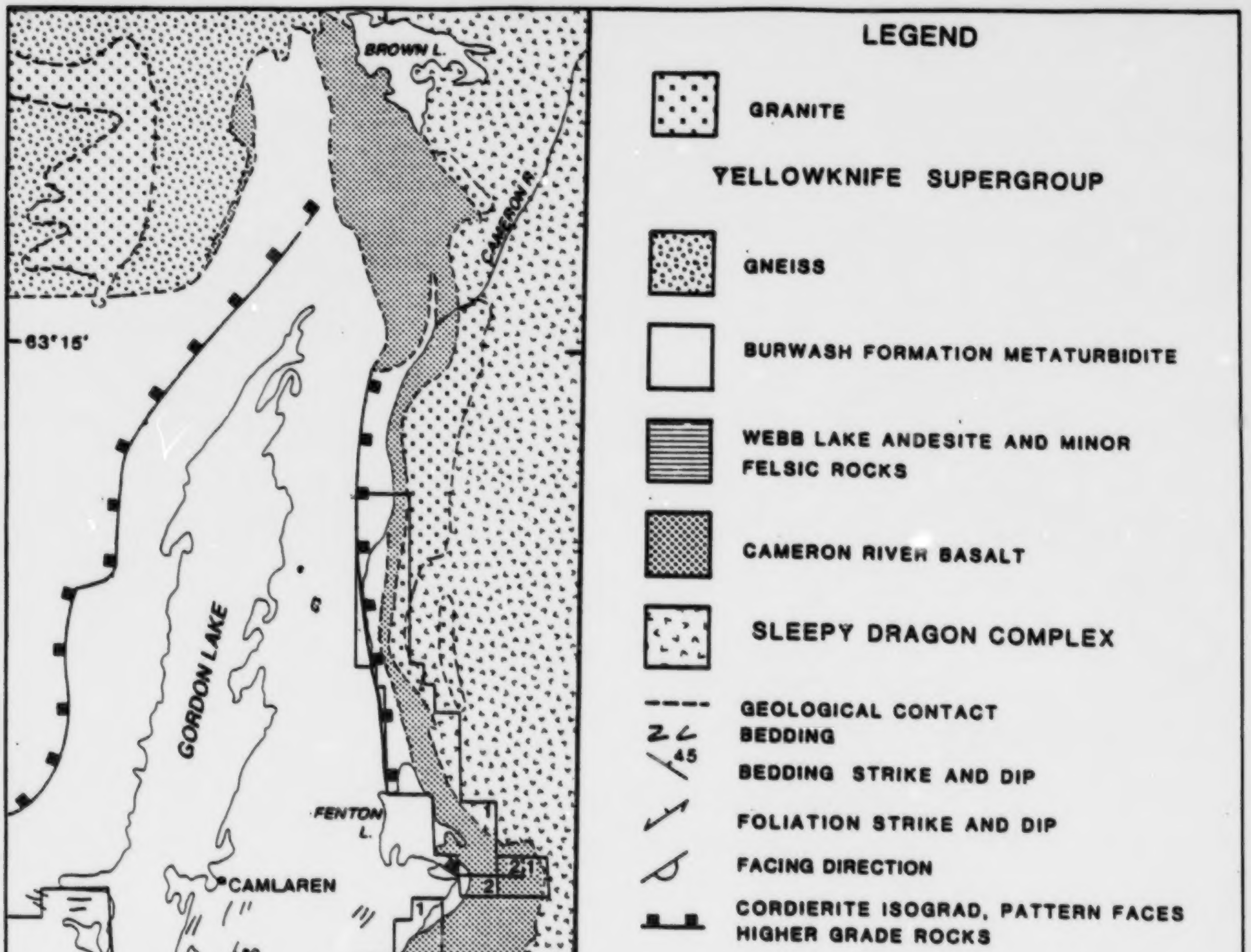
LEGEND
GRANITE
YELLOWKNIFE SUPERGROUP
GNEISS
BURWASH FORMATION METATURBIDITE
WEBB LAKE ANDESITE AND MINOR FELSIC ROCKS
CAMERON RIVER BASALT
SLEEPY DRAGON COMPLEX
GEOLOGICAL CONTACT
BEDDING
BEDDING STRIKE AND DIP
FOLIATION STRIKE AND DIP
FACING DIRECTION
CORDIERITE ISOGRAD, PATTERN FACES HIGHER GRADE ROCKS
PROPERTY BOUNDRY OUTLINE
PROPERTIES
1 LONGSPUR CLAIMS
2 COKE CLAIMS
3 ALLEN LAKE PROJECT
4 RON, TANIA, DANA
5 AP AND RED
6 GBI
7 WGK
8 MAHE PROPERTY
BROWN L.
CAMERON R.
GORDON LAKE
FENTON L.
CAMLAREN
63°15'
62°45'
113°
45
70
80
75
85

FIGURE 8-65: Geology and claim group outlines where 1986-87 work is reported in the Gordon Lake-Cameron River areas.

average width of 9 m to a depth of 121 m. Intersections were characterised by a high nugget effect making grade determination difficult. In 1985 11 NQ-size holes were drilled for 1587 m.

DESCRIPTION

On the property Burwash Formation greywacke with interbedded carbonaceous siltstone or argillite, slate and phyllite is isoclinally folded about northwest to west-northwest axes. In the Kidney Pond zone, auriferous quartz breccias are stratabound within thin-bedded alternating wackes and carbonaceous siltstones. These stratabound breccias were formed by intense, dextral bedding-parallel shear and complex repeated enechelon veining induced by asymmetrical tightening of the east limb of the Gordon Lake refold. The breccias are associated with distinct crenulation cleavage (Stokes *et al.*, 1989).

The west-northwest-striking mineralised zone has been traced along strike for 305 m, is open at depth and to the northwest and varies in thickness from 6 m to in excess of 30 m both along strike and at depth. Sulphide content is generally 2-3% and includes arsenopyrite, pyrrhotite, pyrite, chalcopyrite and galena, in decreasing order of abundance.

CURRENT WORK

During April to September 1986 contractor, Tonto Mine Development Ltd., completed 818 m of underground development, including a 488 m decline, two 3 m by 4.27 m drifts at the 61-m level totalling 165 m to test the No. 1 or Kidney Pond zone (Fig. 8-66). Giant Bay Resources drilled 2633 m of NQ core drilled during 1986: 791 m in 2 holes from surface and 1842 m in 70 holes on 13 sections from underground. Underground work included collecting between 30 and 75 2-3.5 kg grab samples from each round, chip sampling each face, wall and raise, and geologic mapping. Ore reserves using a 6.86 g/t Au cut off, a 1.2 m minimum width and a 2.8 specific gravity for assays cut to 69 g/t Au are 156 842 t at 17.28 g/t Au (DIAND assessment report 082129).

GBI CLAIMS

Candorado Mines
302 - 543 Granville St.
Vancouver, B.C., V6C 1X8

Gold
85 I/14
62°47'N, 113°15'W

REFERENCES

Gibbins *et al.* (1977); Henderson (1941); Henderson (1985); Lord (1951); Seaton *et al.* (1987).

DIAND assessment reports: 081471, 082634, 082108, 082304.

PROPERTY

GBI 1, 2, and 3.

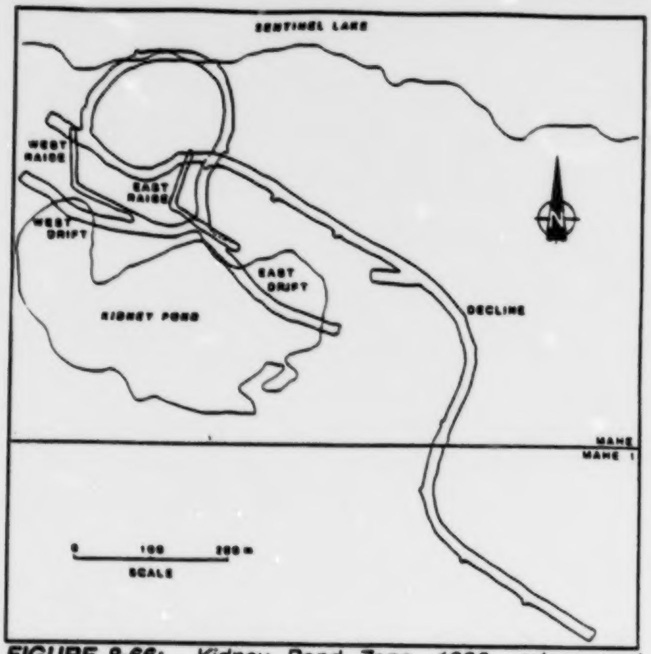

FIGURE 8-66: Kidney Pond Zone, 1986 underground exploration.

LOCATION

The claims are between Dome Lake and Myrt Lake, about 12 km south of Gordon Lake and 70 km northeast of Yellowknife (Fig. 8-65).

HISTORY

The area has been extensively prospected, staked and restaked since prospectors working for Dome Mines Ltd. discovered gold showings south of Gordon Lake in 1938. Most of the area was previously covered by Dome's SDC group (Lord, 1951). Historical coverage is provided by Seaton *et al.* (1987). Claims GBI 1, 2 and 3 were recorded in 1980, 1981 and 1987 respectively.

DESCRIPTION

The claims are underlain by Burwash Formation, tightly folded, greenschist-grade, interbedded greywacke and shale with 2-15 m gossans marking beds of banded, graphitic iron formation with disseminated pyrite. Cross-cutting veins and lenses of quartz with sulphides containing gold are often associated with folds and fault zones and have been trenched (Seaton *et al.*, 1987).

CURRENT WORK

In 1987, percussion drilling of 223.7 m in 14 holes tested the number 10 showing, a large pod of grey quartz at the contact between sheared graphitic schist and massive greywacke. Accessory minerals include visible gold, arsenopyrite, pyrite, pyrrhotite, galena and chalcopyrite. Drilling was followed by geologic mapping and sampling.

WGK-1

Westfort Petroleums Ltd.	Gold
2001, 717 7th Ave. SW	85 I/14
Calgary, Alta. T2P 0Z3	62°47'N, 113°15'W

REFERENCES

Henderson (1985); Henderson (1941).
DIAND assessment report: 082553.

PROPERTY

WGK 1.

LOCATION

The claim is west of the Cameron River, 13 km south of Gordon Lake and 67 km northeast of Yellowknife (Fig. 8-65).

HISTORY

Gold was discovered in the area in 1938 by Dome Mines Ltd. Trenching, bulk sampling and drilling were completed in 1939 which outlined the WT zone. The claims lapsed in 1959 and the WGK claim was staked in July 1984.

DESCRIPTION

The claim is underlain by Burwash Formation, thick-bedded greywackes, laminated to medium-bedded argillites and siltstones with interbedded graphitic argillite, silicate- and sulphide-facies iron formation. These metasediments are folded and cross-cut by shear zones typically in argillite and iron formation-rich portions of the stratigraphy. Two mineralised zones, 13 and the None, are recognised. The 13 zone is an extensive east-trending shear which includes a grey quartz vein 43 m long by 2.4 m wide containing visible gold and associated arsenopyrite, pyrite, pyrrhotite, galena and sphalerite. The None zone, an auriferous quartz blow out, is at the west extension of the 13 zone where the strike swings round to 110° and intersects another structural trend at 130°. The best assay, 14.8 g/t Au, is a sample of iron formation cross-cut by quartz veins.

CURRENT WORK AND RESULTS

In summer of 1987 a ground magnetometer survey, geologic mapping and prospecting were completed and 42 grab samples and 2 chip samples from trenches were collected. Five equally spaced AX standard drill holes for 77.1 m of core were drilled along a 24 m strike length of Zone 13. Assays varied from a trace in argillite to 41.1 g/t Au over 0.64 m in an intersection of predominantly medium to dark blue-grey quartz. In September the claim was included in an airborne HEM and magnetic survey flown by DIGEM.

LONGSPUR PROPERTY

BHP-Utah Mines Ltd.	Gold
1600 - 1050 W. Pender St.	85 P/2,3; 85 I/15
Vancouver, B.C., V6E 3S7	63°04'N, 112°58'W

REFERENCES

Cullen (1986); Henderson (1985); Lambert (1982); Moore *et al.* (1951).
DIAND assessment report: 082702.

PROPERTY

LONGSPUR, LONGSPUR 2 - 7, LONGSPUR 9 - 15.

LOCATION

The LONGSPUR claims are on the east shore of Fenton Lake and the Cameron River, 100 km northeast of Yellowknife (Fig. 8-65).

HISTORY

LONGSPUR and LONGSPUR 2 - 7 were recorded in 1986, LONGSPUR 9 - 12 were added in 1987 and LONGSPUR 13 - 15 in 1988 by BHP-Utah Mines Ltd. to cover anomalous gold assay results from samples collected during reconnaissance of the Cameron River volcanic belt.

DESCRIPTION

The Longspur property covers 24 km of the north-trending contact between Burwash Formation metaturbidites and conformably underlying metavolcanics of the Cameron River volcanic belt (Figs. 8-56, 8-67). South of Fenton Lake the volcanic belt has a maximum width of 1.8 km. At Fenton Lake the strike of the belt changes from northeast to north "The Fenton Elbow" (Cullen, 1986) and the belt narrows to 0.5 km (Fig. 8-67). The volcanic belt overlies the granitoid terrain of the Sleepy Dragon Complex to the east. It is a west-facing steeply dipping homocline comprising amphibolite-grade dominantly basaltic to andesitic flows, with interflow greywacke and quartz-feldspar porphyry units, interpreted to represent felsic volcaniclastics which vary laterally to quartzite and calcsilicate schists and marbles. Burwash Formation sediments are isoclinally folded quartz-mica schist, cordierite-knotted quartz-mica schist and quartz-garnet-mica schist. Numerous Archean metagabbroic dykes and sills, up to tens of metres thick, strike subparallel with the belt, are most abundant at the east margin of the belt and intrude volcanics and the underlying granitoids. They rarely cross-cut the overlying sediments.

Proterozoic, north- to northwest-trending, diabase dykes cross-cut all units.

CURRENT WORK AND RESULTS

During 1986 BHP-Utah explored the Cameron River volcanic belt. Samples of silicified meta-andesite containing sulphides found close to the contact between Cameron River volcanics and Burwash metasediments assayed up to 720 ppb Au. A 15 cm by 2 m lens of quartz containing visible gold in metasediments was found on the contact. Assays were up to 41.2 g/t Au (Fig. 8-67). In 1987, 36 line-km of grid were cut and 69 line-km of grid were flagged for control of 1:5000 scale mapping and total field magnetometer and VLF EM surveys with station spacing at 12.5 m and 25 m respectively (Fig. 8-67). IP was completed over selected areas, totalling 6.7 line-km. Sampling showed that gold is associated with:

1. silicified metasediments, now quartz-biotite schists cross-cut by quartz veins and stringers with arsenopyrite and lesser pyrite and pyrrhotite close to the volcanic contact. The highest assay to date is 3560 ppb Au. The main showing, described above, found on the LONGSPUR claim, is enveloped by silicified metagreywacke with minor

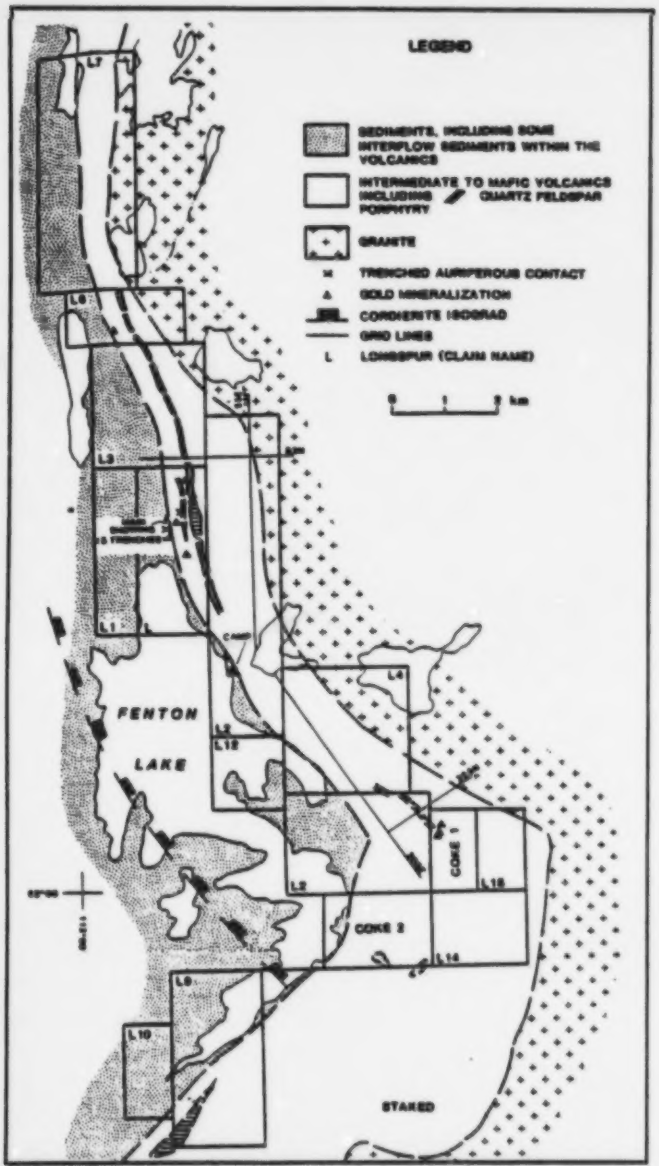
LEGEND
SEDIMENTS, INCLUDING SOME INTERFLOW SEDIMENTS WITHIN THE VOLCANICS
INTERMEDIATE TO MAFIC VOLCANICS INCLUDING QUARTZ FELDSPAR PORPHYRY
GRANITE
TRENCHED AURIFEROUS CONTACT
GOLD MINERALIZATION
CORDIERITE ISOGRAD
GRID LINES
L LONGSPUR (CLAIM NAME)
0 1 2 km
FENTON
LAKE
COKE 1
COKE 2
L7
L8
L3
L1
L4
L2
L12
L15
L14
L9
L10
STAKED

FIGURE 8-67: *Geology, grids and showings on the LONGSPUR claim group and COKE claims.*

arsenopyrite and pyrite. A chip sample across a 1 m width of the intensely altered halo (closest to the quartz lens) assayed 70.29 g/t Au. Although the sediment-volcanic contact is generally poorly exposed it was traced in 1987 using IP. The IP survey also identified several northeast-striking linears on LONGSPUR 3, north of the main showing, which were found to be poorly exposed shears, roughly 2 m wide containing abundant arsenopyrite (Fig. 8-67). Assays were anomalous in gold, zinc, lead, copper and silver. In 1987 within the contact area 6 trenches totalling 46.6 m were excavated. Trench #1 exposed a 14 m strike of quartz-veined, locally silicified greywacke and three adjacent 0.5 m intervals sampled returned 1870, 10 100 and 1050 ppb Au respectively. Trench #4 exposed a 6 m strike length of the contact between quartz-veined felsic tuff and greywacke with arsenopyrite, pyrrhotite and pyrite. Assays from a 2.3 m interval ranged from 530 to 3405 ppb Au.

2. the base of interflow metasediments particularly one 100 m wide band which has been mapped over a 1.3 km strike length (Fig. 8-67). The metasediments are cross-cut by quartz veins containing pyrrhotite and pyrite; the highest assays are 325 ppb.
3. quartz-feldspar porphyry and accompanying carbonate units especially at the contacts with mafic volcanics, where copper, zinc and silver content are also anomalous. This zone is typically the most sulphide rich, 20% pyrite and pyrrhotite is common and it has been traced using VLF in areas of overburden.

COKE Claims

Giant Yellowknife Mines Ltd.	Gold
Bag 3000	85 I/15; 85 P/2
Yellowknife, NWT, X1A 2M2	63°00'N, 112°55'W

REFERENCES

Henderson (1985); Lambert (1988); Moore *et al.* (1951). DIAND assessment report: 082550.

PROPERTY

COKE 1-2.

LOCATION

The claims are on the southeast side of Fenton Lake, 105 km north-northeast of Yellowknife (Figs. 8-65, 8-67).

HISTORY

The claims were recorded in September of 1985 for Asamera Inc. to cover gold-bearing sulphide showings found during exploration of Cameron River metavolcanics. Giant Yellowknife Mines Ltd. conducted work in 1986 as a partner in a joint venture with Asamera and Kelmet Resources.

DESCRIPTION

The property is mainly underlain by mafic volcanics of the Cameron River volcanic belt (Fig. 8-56). Within a northeast-trending sequence of basic flows on COKE 1, a sulphide iron formation several metres wide and 100 m in strike length was sampled. Results include a geochemical anomaly of 180 ppb Au. COKE 2 covers the north-trending pyrite-carbonate Ladder zone, from which rock geochemical anomalies of up to 90 ppb Au were obtained in 1985. These are considered to be zones of exhalative interflow.

CURRENT WORK AND RESULTS

Work in 1986 was concentrated on the Ladder zone, a vuggy, pyrite, pyrrhotite silica-flooded fault zone forming a positive north-trending topographic lineament. The zone was geologically mapped at 1:2000 scale and three trenches were excavated. Six samples assayed trace to 0.34 ppm Au. Ten other rock samples were collected during reconnaissance prospecting.

ALLAN LAKE PROJECT

Ghost Lake Resources Ltd.	Gold, Zinc
P.O. Box 141	85 I/14,15
Rae, NWT, X0E 0Y0	62°54.5'N, 113°01.5'W

REFERENCES

Lord (1951); Henderson (1985); Henderson (1941); Lambert (1988).

DIAND assessment reports: 081641, 082060.

PROPERTY

AV, FF, JFD, JOE, JTC, GO, G.WEE, KEE, MAJ, NORA, RAE, RIETTE, and SOPHIEY totalling 2577 ha.

LOCATION

The property is east of Allan lake, about 85 km northeast of Yellowknife (Fig. 8-65).

HISTORY

The property covers part of the area staked in 1947 as the MINDOT claims by Gateway Gold to cover a quartz vein with gold, chalcopyrite, arsenopyrite, native bismuth, native copper and malachite on which trenching and sampling were carried out (Lord, 1951). In 1953 Gateway Gold drilled three holes for 107 m and in 1957, Pickle Crow Mines Ltd. drilled four holes totalling 172 m. In 1959, J.R. Woolgar drilled 1525 m distributed between:

1. the Mindot vein, explored by 13 holes along a strike length of 100 m. The vein graded up to 8.56 ppm Au across widths of less than 1 m. The vein strikes N30°E and dips 20° to 35° southeast. It cross-cuts pillowed flows.
2. a chloritized shear zone, explored by 30 holes along a strike length of 1036 m. Only one substantial gold assay, 12.34 ppm Au across 2 m, was obtained, but the zone often comprised up to 30% pyrite, pyrrhotite, chalcopyrite, sphalerite and arsenopyrite across widths of 1-2 m.
3. a discontinuous quartz lens, probed by four holes.

John Doucette staked the JFD claim, to cover the three showings in May 1982 and did some trenching and assayed several rock samples for gold and silver (DIAND assessment reports: 082060, 081641). The remaining claims were recorded in 1983 and early 1984 and all were transferred to Ghost Lake Resources in 1984.

DESCRIPTION

The property spans the northeasterly trending contact between metaturbidites of the Burwash Formation to the west and mafic metavolcanics of the Cameron River volcanic belt to the east (Fig. 8-65). The volcanics comprise massive to pillowed mafic flows, amphibolite, tuff, volcaniclastics and graphitic schist. These units are cut by gabbroic dykes, quartz veins, and locally by northeast-trending chloritized, silicified and sulphidized shears up to 25 m wide. A zone of rhyolite, rhyolite breccia and quartz breccia is exposed at the south end of Hank Lake near the intersection of north- and east-trending lineaments.

CURRENT WORK AND RESULTS

Work done in 1983 and 1984 is reported here because it was filed after the previous Mineral Industry Report was written. In 1983 a three-person crew spent two days evaluating the property and testing the EM responses of conductive zones. In 1984, a grid was established and used as a base for 1:5000 scale geological mapping and magnetometer and VLF EM geophysical surveying. Some of the core from the 1959 drilling of the shear zone was collected for assay. South of Hank Lake, zinc grades of 2.5% and 4.85% were obtained over widths of up to 25 m. One assay of 3.1 ppm Au was obtained from a grab sample of pyritic rhyolite breccia.

TANIA, DANA, RON Claims

Cove Energy Corporation	Gold, Base Metals
1730, 999 W. Hastings St.	85 I/14
Vancouver, B.C., V6C 2W2	62°49'N, 113°10'W

REFERENCES

Henderson (1985); Henderson (1941); Lambert (1988).

DIAND assessment reports: 017969, 018842, 082151, 082209.

PROPERTY

TANIA, DANA, and RON (543 ha).

LOCATION

The claims are 100 km east of Yellowknife on Webb Lake.

HISTORY

The property partly coincides with an area previously staked as the RS group, which was drilled by Giant Yellowknife Mines Limited in 1967 (DIAND assessment report 017969) and geophysically surveyed by Anglo Celtic Explorations Limited in 1969 (DIAND assessment report 018842). The claims were staked in 1984 and 1985 and were transferred to Cove Energy Corporation in November 1985.

DESCRIPTION

The claims cover part of the Cameron River volcanic belt and are underlain predominantly by northeasterly trending, steeply dipping metabasalts. Samples from old trenches that expose arsenopyrite-bearing quartz veins in shear zones assay up to 24 ppm Au.

CURRENT WORK AND RESULTS

Work done in 1985 is reported here as it was filed after the previous Mineral Industry Report was written. In 1985, magnetometer and EM surveys were conducted on 3 grids (Fig. 8-68; DIAND assessment report 082151). Three holes totalling 390 m drilled in late 1985 on the origin grid (Fig. 8-68), and another five holes for 459 m in 1986 intersected mafic to intermediate metavolcanic rocks and graphite metasediments and cherty tuff. The graphite sediments contain minor pyrrhotite, pyrite, sphalerite, and chalcopyrite.

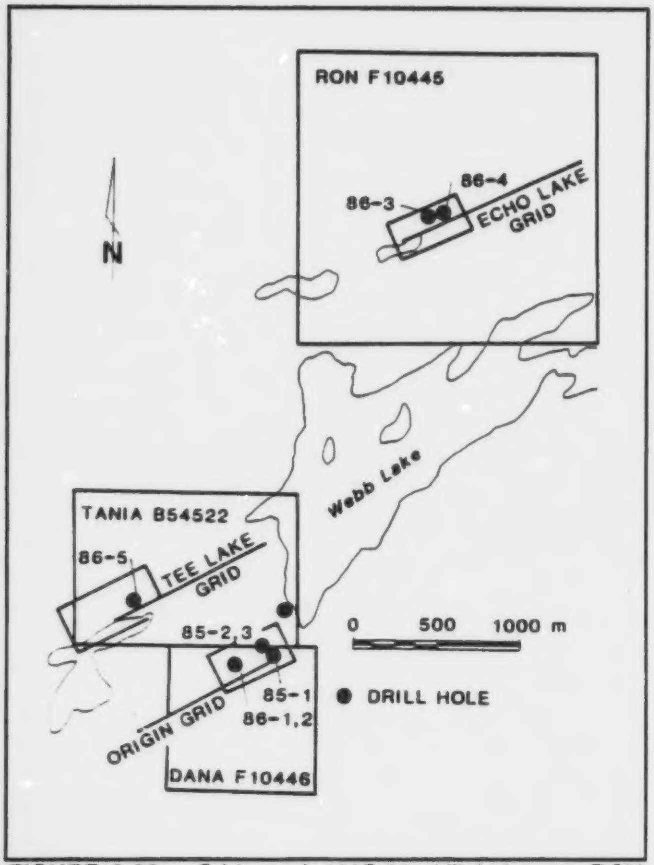

FIGURE 8-68: Grids and 1985-86 drill holes on RON, TANIA and DANA claims.

AP AND RED

Tanqueray Resources Ltd.
100 - 625 4th Ave. SW
Calgary, Alta., T2P 0K2

Gold, Zinc
85 I/14
62°47'N, 113°13'W

REFERENCES

Gibbins *et al.* (1977); Henderson (1985); Henderson (1941); Lambert (1988); Seaton (1978, 1984).

DIAND assessment reports: 019193, 080017, 080167, 080177, 080469, 081130, 082059, 082656.

PROPERTY

AP, AP 3-4, AP 44, AP 45, AP 47, AP 48, RED, RED 2 (1484 ha).

LOCATION

The claim group is on the Cameron River east of Myrt Lake approximately 70 km northeast of Yellowknife (Fig. 8-65).

HISTORY

Dome Mines Limited discovered the WT gold showings west of the AP claims in 1938, and in 1945 the Prospect Street Syndicate staked a large block of claims that included the area now covered by the AP and RED block. The claims are owned by C. Vaydik and have been staked and restaked since 1967. Work in the early 1970's included prospecting and sampling of arsenopyrite-rich quartz veins (DIAND assessment reports: 019193, 080017). In 1974 Precambrian Shield Resources Ltd. optioned the property and did additional sampling (DIAND assessment report 080167). In 1975, detailed (1 inch = 200 feet) geological mapping, and ground EM and magnetometer surveys defined a moderate conductor flanked by a magnetic conductor. Results from drilling of 444.7 m in four holes, AP 01-04 (DIAND assessment reports: 080177, 080469) included a 5.18 m intersection in AP 01 of 4.4 g/t Au and a 3.05 m intersection in AP 02 of 4.8 g/t Au. Zinc and copper contents were anomalous; the best zinc assay was 1.04% Zn over 3 m. In 1979 Giant Yellowknife Mines Ltd. optioned the property and in 1980 drilled 3 holes, AP 05-08 for 472 m of core. Assays from 0.34 to 0.68 g/t Au were common throughout the holes and AP-08 returned 3.42 g/t Au over 0.46 m. Giant also conducted lithogeochemical and gossan sampling to outline alteration zones. Gossan samples commonly returned assays from 0.34 g/t Au to 1.71 g/t Au; the highest was 11.6 g/t Au. In 1981, Giant drilled 415 m in three holes based on their interpretation of the chemical data. Discouragingly low gold assays were returned and Giant dropped the option.

In 1985, Aber Resources Ltd. optioned the property, established a new grid on 20 m line and station spacing and conducted geological mapping, sampling and ground EM and magnetic surveys. Grab samples assayed from trace to 10.28 g/t Au. Aber drilled three holes, AP 12-14, which intercepted 1.03 g/t Au over 5 m in AP 12, 0.83 g/t Au over 6 m in AP 13 and 1.99 g/t Au over 12 m in AP 14.

DESCRIPTION

Mafic to felsic flows and agglomerates of the Cameron River volcanic belt and conformably overlying metasediments, chiefly turbidites, form a north-trending east-dipping homocline (Fig. 8-69). Silicate iron formation containing amphibole, garnet and minor sulphides at the contact between the volcanics and the sediments is sheared and cross-cut by quartz veins. This is referred to as the Shear zone. The contact between mafic-intermediate and felsic volcanics is characterised by carbonate alteration, sulphides and quartz veining and is called the Sulphide zone. Drilling intercepted altered volcanics and sediments cross-cut by quartz veins and stockworks containing pyrrhotite, arsenopyrite, pyrite, chalcopyrite, sphalerite and trace galena.

CURRENT WORK

In 1987 Tanqueray optioned the property and geologically mapped, prospected, and had an HEM-MAG survey flown by Dighem. Four diamond drill holes, T 87-1 to T 87-4, for 469.3 m of core tested geophysical conductors on AP 45. Drill hole T 87-4 returned the best assay, 0.75 g/t Au over 1.5 m (Fig. 8-69).

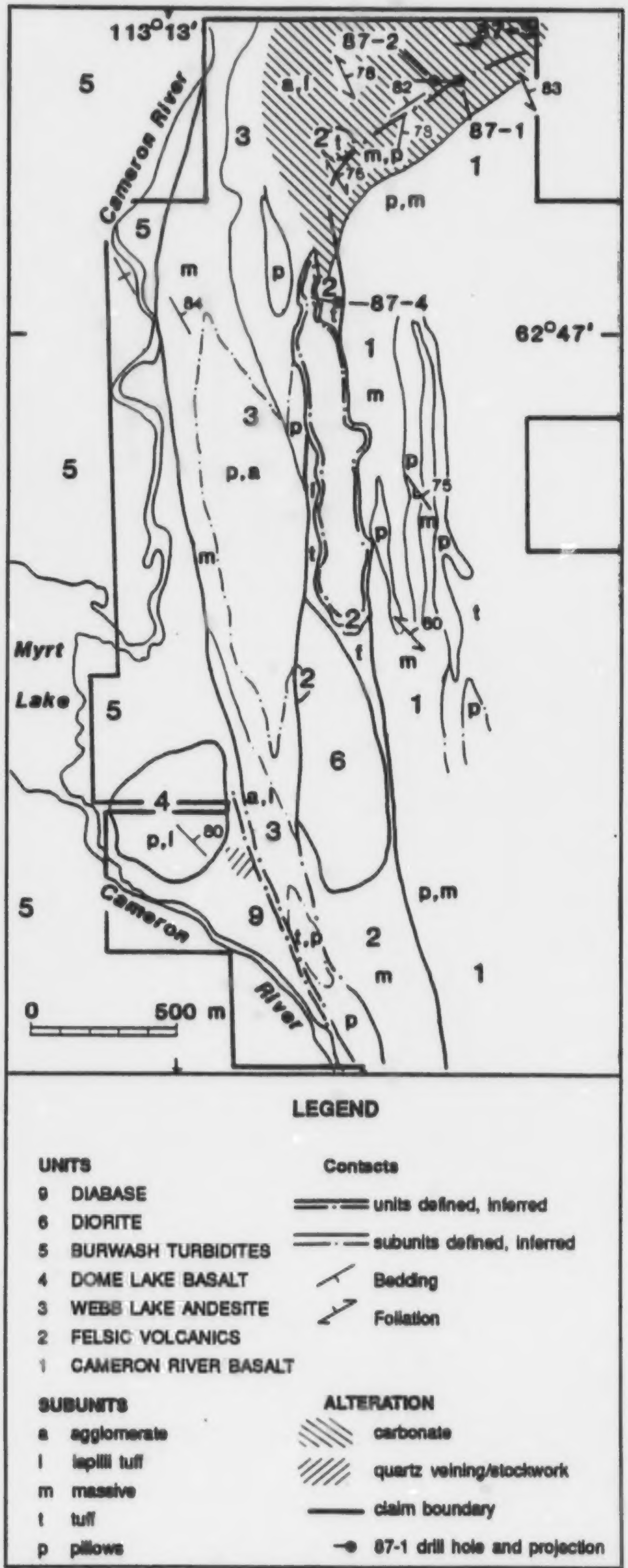
113°13'
87-2
87-3
a,l
78
82
83
87-1
2
m,p
76
3
1
5
Cameron River
p,m
p
m
84
87-4
62°47'
p,a
75
t
80
Myrt Lake
6
4
a,l
p,l
9
t,p
0
500 m
LEGEND
UNITS
9 DIABASE
6 DIORITE
5 BURWASH TURBIDITES
4 DOME LAKE BASALT
3 WEBB LAKE ANDESITE
2 FELSIC VOLCANICS
1 CAMERON RIVER BASALT
SUBUNITS
a agglomerate
l lapilli tuff
m massive
t tuff
p pillows
Contacts
units defined, inferred
subunits defined, inferred
Bedding
Foliation
ALTERATION
carbonate
quartz veining/stockwork
claim boundary
87-1 drill hole and projection

FIGURE 8-69: Geology and 1987 drill holes on AP and RED claims.

SULPHIDE LAKE PROJECT

Noranda Exploration Co. Ltd. (N.P.L.)	Base Metals, Silver, Gold
4 - 2130 Notre Dame Ave.	85 I/10,11
Winnipeg, Man., R3H 0K1	62°36' N, 112°54'W

REFERENCES

Henderson (1985); Lambert (1988); Padgham *et al.* (1975); Seaton *et al.* (1987).

DIAND assessment reports: 017317, 017320, 017322, 081985, 082518, 082616.

PROPERTY

VIC 01, NORA 1-9, XXX 01,02,04, CATH, JUD, MIKE, SNOOT 1,2, BETH, BRIAN, MOE and SUE.

LOCATION

The claims are 75 km northeast of Yellowknife and extend from Victory Lake east to Detour Lake and south to Devore Lake (Fig. 8-70).

HISTORY

The claims are contiguous with the EMILY 2 claim covering base metal showings staked in 1937 as the RUTH claims and trenched and drilled by Cominco between 1937 and 1939. The gossanous showings of pyrite, chalcopyrite, pyrrhotite, galena, sphalerite and arsenopyrite are at the contact between rhyolite and sediments. In 1953 Cominco again staked the ground as the LEN claims and conducted EM surveys which delineated a strong conductor. Nine holes were drilled aggregating 506 m to test 609 m of strike. The best results are from a 10.9 m intersection averaging 3% combined Zn and Pb enveloping a 6.1 m interval with 1.17% Zn, 2.2% Pb and 42 ppm Ag. In 1971 Teck Corporation and Great Plains Development had an INPUT EM survey flown over the area. In 1983-84 Noranda staked 31 claims to cover AEM anomalies from the 1971 survey. Subsequent work, the Weaver Lake project, included ground geophysics and 400 m of drilling in 5 holes (DIAND assessment report 081985; Seaton *et al.*, 1987).

DESCRIPTION

The property is underlain by the Detour-Turnback lakes and Beaulieu River volcanic belts of the Archean Yellowknife Supergroup (Fig. 8-56; Henderson, 1985; Lambert, 1988). Folded mafic flows, intermediate and felsic flows and tuffs with minor intercalated sediments are bounded to the southwest by lower amphibolite-grade metasediments. Units are intruded by numerous small plugs, dykes and sills ranging from granodiorite to feldspar porphyry and granite associated with the large intrusions on the east and west margins of the property (Fig. 8-70).

CURRENT WORK AND RESULTS

Exploration in 1986 and 1987 included collecting 165 samples, and mapping at 1:31 680 scale the "sulphide area" covered by parts of NORA 2-6, SNOOT 2, JUD, MIKE and CATH and the EMILY 2 claim. Sampling, mapping at 1:2500 and a gravimetric survey were completed on the SUE claim (Fig. 8-70).

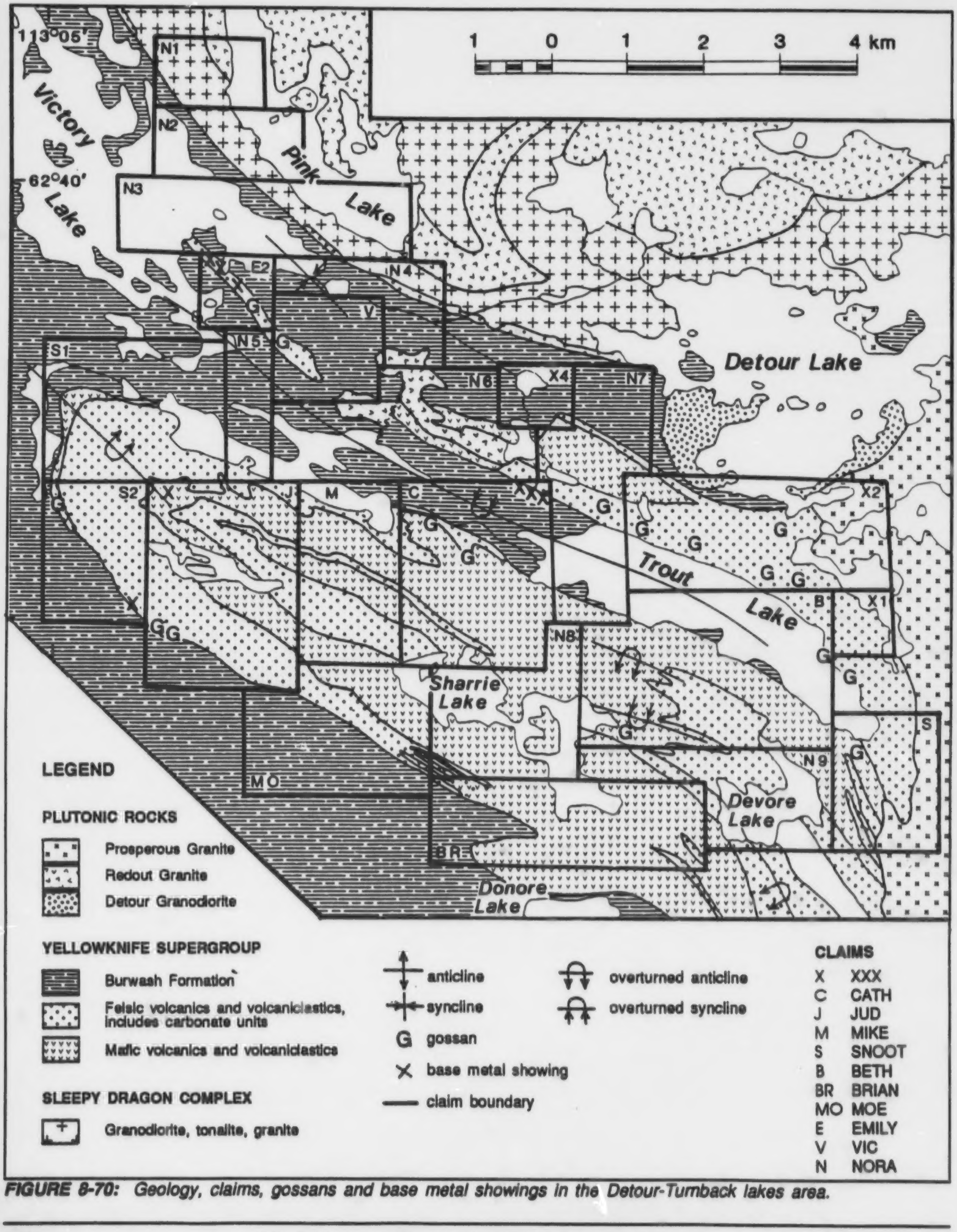
113°05'
62°40'
1 0 1 2 3 4 km
Victory Lake
Pink Lake
Detour Lake
Trout Lake
Sharrie Lake
Devore Lake
Donore Lake
N1
N2
N3
N4
N5
N6
N7
N8
N9
E2
V
X4
S1
S2
J
M
C
X2
X1
B
S
MO
BR
G
LEGEND
PLUTONIC ROCKS
Prosperous Granite
Redout Granite
Detour Granodiorite
YELLOWKNIFE SUPERGROUP
Burwash Formation
Felsic volcanics and volcaniclastics, includes carbonate units
Mafic volcanics and volcaniclastics
SLEEPY DRAGON COMPLEX
Granodiorite, tonalite, granite
anticline
syncline
G gossan
× base metal showing
claim boundary
overturned anticline
overturned syncline
CLAIMS
X XXX
C CATH
J JUD
M MIKE
S SNOOT
B BETH
BR BRIAN
MO MOE
E EMILY
V VIC
N NORA

FIGURE 8-70: Geology, claims, gossans and base metal showings in the Detour-Turnback lakes area.

Targets include:

1. base metals, sphalerite, galena and pyrite are interbanded with siliceous layers within intermediate volcanics. These form gossanous zones extending from Victory Lake through EMILY 2 and on to VIC 1, and similar showings on SUE 1.
2. gold in siliceous oxidized iron-rich zones along volcanic-sedimentary contacts which locally are sheared and contain quartz veins.
3. numerous contact-related gossans and oxidized shear zones.

KA and PAM CLAIMS

Giant Yellowknife Mines Ltd.
Bag 3000
Yellowknife, NWT, X1A 2M2

Gold, Base Metals
85 P/1
63°17'N, 112°12'W

REFERENCES

Covello *et al.* (1988); Moore *et al.* (1951); Roach (1988); Seaton *et al.* (1987); Stubley (1989).

DIAND assessment reports: 019652, 081888, 082552.

PROPERTY

KA 1, PAM 1-2.

LOCATION

The claims are in the Bridge Lake - Top Lake area south of Beniah Lake, 120 km northeast of Yellowknife.

HISTORY

The area was explored in the early 1970's for base metals. Just east of KA 1 on the former GG 9 claim a diamond drill hole intersected 2.4 m grading 0.12% Zn, 0.08% Cu, 10.29 ppm Ag, 0.34 ppm Au (DIAND assessment report 019652). The KA 1 claim east of Bridge Lake was recorded for Mr. William Kizan in August of 1983 and transferred to Giant Yellowknife Mines Ltd. in May, 1985. That year, Giant discovered and sampled showings and collected samples from trenches, probably dating from the mid-1940's (Seaton *et al.*, 1987; DIAND assessment report 081888).

DESCRIPTION

The KA and PAM claims are underlain by volcanics of the northern portion of the Beaulieu volcanic belt; granitic gneisses crop out to the west of Bridge Lake and to the east of Top Lake (Fig. 8-71; Moore *et al.*, 1951). Volcanics are dominantly mafic flows with lesser felsic volcanics, intermediate and irregular gabbro bodies, felsic dykes and intermediate flows.

CURRENT WORK AND RESULTS

In 1986, exploration by Giant found a series of 1 m wide sulphidic zones in intermediate volcanic rocks. A sample collected from the Notag showing, 450 m south of Top Lake, assayed 6.2 ppm Au (Fig. 8-71). The showing was protected by staking PAM 1-2 in September, 1987. A grid was established to serve as a base for 1:2000 scale mapping. Eleven samples were collected from the grid, including five from trenches previously excavated on the Notag showing. No samples taken in the 1987 survey returned significant assays, and anomalies previously obtained from trench samples could not be duplicated.

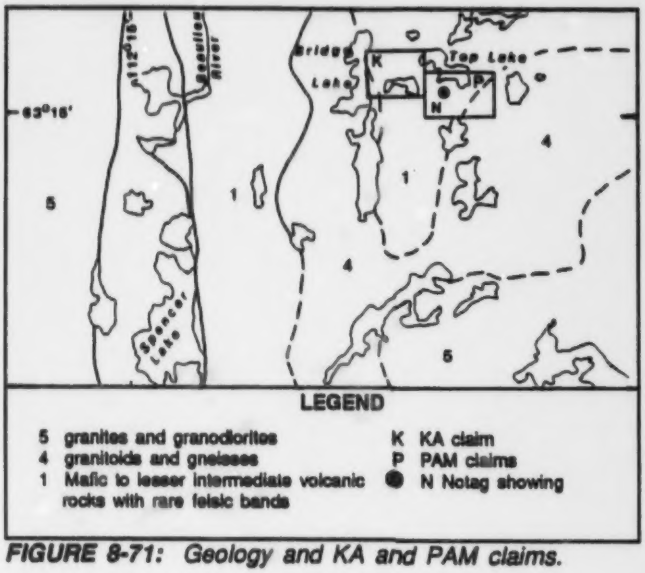
112°15'
Beaulieu River
Bridge Lake
K
Top Lake
P
N
63°15'
5
1
1
4
4
5
Spencer Lake
LEGEND
5 granites and granodiorites
4 granitoids and gneisses
1 Mafic to lesser intermediate volcanic rocks with rare felsic bands
K KA claim
P PAM claims
● N Notag showing

FIGURE 8-71: Geology and KA and PAM claims.

SUNRISE JOINT VENTURE

Aber Resources Ltd.
700, 1177 W. Hastings St.
Vancouver B.C., V6E 2K3

Base Metals, Silver, Gold
85 I/16; 85 P/1
62°55'N, 112°22'W

REFERENCES

Henderson (1985); Lambert (1988); Moore *et al.* (1951); Vivian *et al.* (1988).

DIAND assessment report: 082690.

PROPERTY

DJ 1-18, DOUG 1 and SIDE 1 (Fig. 8-72).

LOCATION

The property is 115 km east-northeast of Yellowknife on the Beaulieu River (Fig. 8-56). The right of way for the Ingraham Trail extension is surveyed and cut to within 5 miles west of Sunrise Lake.

HISTORY

The claims were recorded in late 1987 and are held under a joint-venture agreement between Aber Resources Ltd., operator, and Hemisphere Development Corporation.

DESCRIPTION

The property covers a 32 km long segment of the Archean Beaulieu River volcanic belt of the Yellowknife Supergroup (Fig. 8-56). It is underlain by mafic volcanics of the Sunset Lake Basalt, lesser dacidic to andesitic volcanics of the Alice Formation and just north of Sunset Lake by rhyolite flows, tuffs and volcaniclastics (Fig. 8-72).

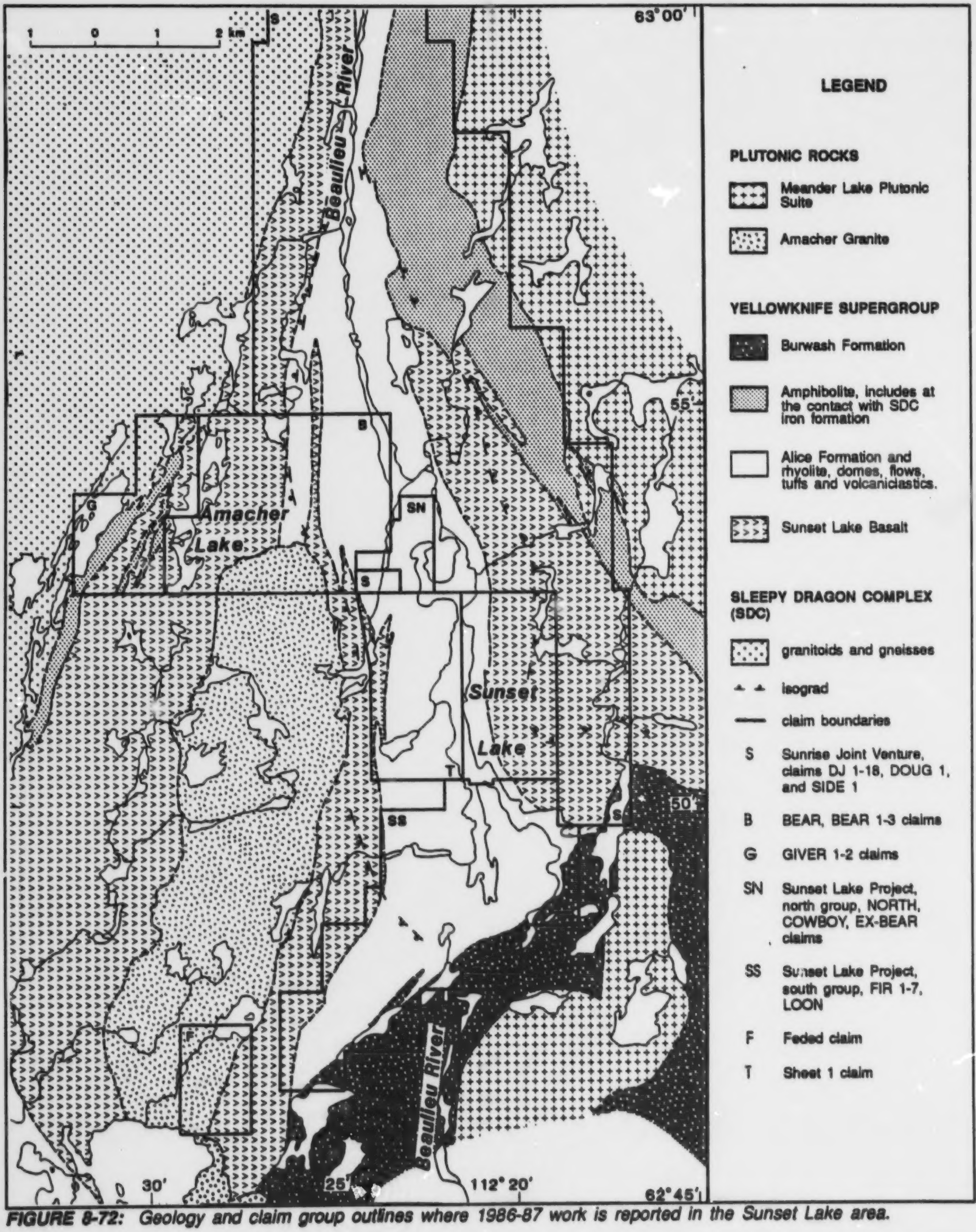
1 0 1 2 km
63°00'
55'
50'
62°45'
30'
25'
112° 20'
Beaulieu River
Amacher Lake
Sunset Lake
Beaulieu River
S
B
G
SN
S
T
SS
S
F
LEGEND
PLUTONIC ROCKS
Meander Lake Plutonic Suite
Amacher Granite
YELLOWKNIFE SUPERGROUP
Burwash Formation
Amphibolite, includes at the contact with SDC iron formation
Alice Formation and rhyolite, domes, flows, tuffs and volcaniclastics.
Sunset Lake Basalt
SLEEPY DRAGON COMPLEX (SDC)
granitoids and gneisses
isograd
claim boundaries
S Sunrise Joint Venture, claims DJ 1-18, DOUG 1, and SIDE 1
B BEAR, BEAR 1-3 claims
G GIVER 1-2 claims
SN Sunset Lake Project, north group, NORTH, COWBOY, EX-BEAR claims
SS Sunset Lake Project, south group, FIR 1-7, LOON
F Feded claim
T Sheet 1 claim

FIGURE 8-72: Geology and claim group outlines where 1986-87 work is reported in the Sunset Lake area.

CURRENT WORK AND RESULTS

In 1986, Aber Resources and Hemisphere Development jointly undertook exploration for gold from north of Beniah Lake to south of Turnback Lake, the Drybones project covering a 100 km strike length of the Beaulieu River volcanic belt. This exploration was under the direction and management of Covello, Bryan and Associates of Yellowknife. On the basis of favourable geology and competitor activity in the area, DJ 1-5 claims were staked in the Sunrise Lake area. In mid-1987, grids were established over which combined magnetometer, VLF and HL EM were conducted. These geophysical surveys detected an overburden-covered conductor having no magnetic expression. The conductor corresponded with an interpreted rhyolite-andesite contact. The first hole was drilled in October 1987 to test a gold-copper showing and it intersected stringer-type base metals. A second hole spotted 120 m to the north along the conductor intersected 5.8 m of sulphides grading 18.3% combined Zn-Pb, 926 ppm Ag, and minor gold and copper. These results prompted additional land acquisition and 15 claims, DJ 6-18, SIDE 1 and DOUG 1, were added to Aber/Hemisphere's land holdings in November 1987 (Fig. 8-72). Drilling continued through 1988. By the end of 1987, 15 holes were completed for 1698.61 m.

The Sunrise deposit is an Archean polymetallic zinc-lead-copper-silver-gold-banded massive sulphide lens hosted by a rhyolite tuff which has been brecciated. The lens is conformable with the stratigraphy, dips at 60°-65° to the east and plunges 60° to the north (Figs. 8-73, 8-74). The ore suite comprises pyrite, sphalerite, galena, tetrahedrite, arsenopyrite, pyrrhotite, chalcopyrite, pyrargyrite, boulangerite, native silver, native gold, gudmundite and stannite. In 1987-88, 65 holes totalling 18 951.34 m of core outlined the ore zone, with a strike length of 160 m, of an average thickness of 3 to 3.5 m and a down-dip projection of approximately 700 m. The ore zone appears to have been deformed by a prominent block fault, indicative of a caldera-type setting. Grade and tonnage calculations suggest: probable tonnage of 1 162 200 t grading 8.35% Zn, 4.05% Pb, 0.09% Cu, 356.61 g/t Ag and 0.99 g/t Au; and possible tonnage at 704 000 t grading 9.76% Zn, 4.51% Pb, 0.11% Cu, 483.4 g/t Ag and 0.92 g/t Au (Vivian *et al.*, 1988).

BEAR CLAIMS

Silver Hart Mines Ltd.	Base Metals, Silver,
5710, 17th St.	Gold
Edmonton, Alta., T6P 1S4	85 I/9,10,15,16
	62°53'N, 112°25'W

REFERENCES

Dudek (1988); Henderson (1985); Lambert (1988); Seaton *et al.* (1987).

DIAND assessment reports: 017315, 081902, 082181, 082814.

PROPERTY

BEAR, BEAR 1-3.

LOCATION

The claims are on the west side of the Beaulieu River in the Sunset Lake area, 110 km east-northeast of Yellowknife (Figs. 8-72, 8-73, 8-75).

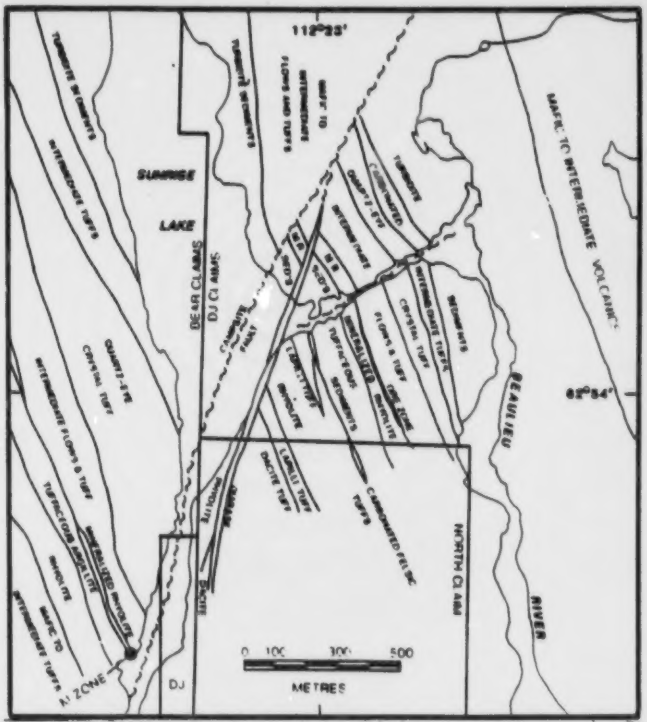

FIGURE 8-73: Geology of the Sunrise deposit area.

HISTORY

Portions of the BEAR claims were staked between 1945-50 and were trenched and drilled although no assessment work was filed. In 1963, ground reconnaissance was conducted along with an airborne magnetic survey by Nochay Investments Ltd. In 1970, an airborne EM survey was completed by Questor. No further work was done on the property and the claims lapsed. Silver Hart Mines Ltd. staked the BEAR claims in 1983. Prospecting in 1983 identified the gold-bearing C zone (Fig. 8-75). Grab samples from the C zone assayed up to 18.5 g/t Au and rock chip samples from trenches assayed up to 12 g/t Au over 1 m. In 1984, ground magnetic and EM surveys were completed over the C zone followed by diamond drilling of 1372 m in 15 holes. In May 1985, the property was optioned to Ark La Tex Industries Ltd.

DESCRIPTION

Mafic volcanic rocks of the Sunset Lake Basalt and mafic sills underlie the west part of the claim group. Alice Formation felsic andesite pillow lavas, pillow breccias, hyaloclastics and minor massive lavas including dacidic types, pyroclastics, volcaniclastic sediments, chert, iron formation and shales with interbedded rhyolite tuffs underlie the eastern part of the claim group (Fig. 8-72). Beds are steeply dipping, folded about north-trending axes and strike north to north-northwest. Gold is associated with (1) disseminated arsenopyrite in chlorite schists, and in schistose, silicified quartz porphyry and (2) massive arsenopyrite in lenses, breccia pods and stringers in zones of silicification associated with iron formation.

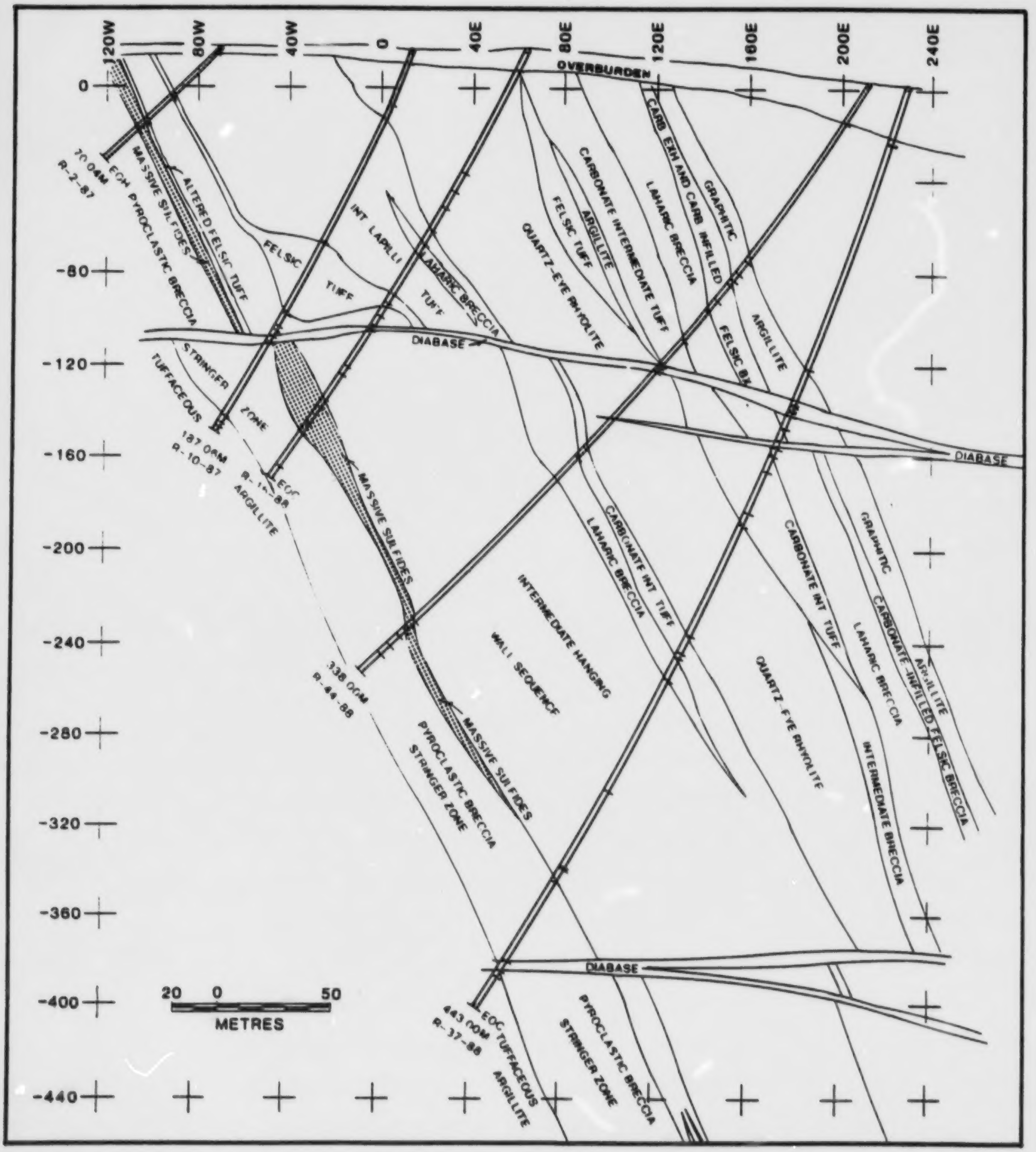
120W
80W
40W
0
40E
80E
120E
160E
200E
240E
0
-80
-120
-160
-200
-240
-280
-320
-360
-400
-440
OVERBURDEN
70.04M
R-2-87
EOH
MASSIVE SULFIDES
ALTERED FELSIC TUFF
PYROCLASTIC BRECCIA
FELSIC
INT LAPILLI TUFF
LAHARIC BRECCIA
CARBONATE INTERMEDIATE TUFF
ARGILLITE
FELSIC TUFF
QUARTZ-EYE RHYOLITE
CARB EXH AND CARB INFILLED
LAHARIC BRECCIA
GRAPHITIC
ARGILLITE
FELSIC BX
DIABASE
STRINGER
ZONE
TUFFACEOUS
187.00M
R-10-87
EOC
R-14-88
ARGILLITE
MASSIVE SULFIDES
DIABASE
CARBONATE INT TUFF
LAHARIC BRECCIA
INTERMEDIATE HANGING
WALL SEQUENCE
CARBONATE INT TUFF
QUARTZ-EYE RHYOLITE
GRAPHITIC
LAHARIC BRECCIA
CARBONATE-INFILLED FELSIC BRECCIA
ARGILLITE
INTERMEDIATE BRECCIA
338.00M
R-44-88
MASSIVE SULFIDES
PYROCLASTIC BRECCIA
STRINGER ZONE
DIABASE
20
0
50
METRES
443.00M
R-37-88
EOC
TUFFACEOUS
ARGILLITE
PYROCLASTIC BRECCIA
STRINGER ZONE

***FIGURE 8-74:** Geological cross section through the Sunrise deposit.*

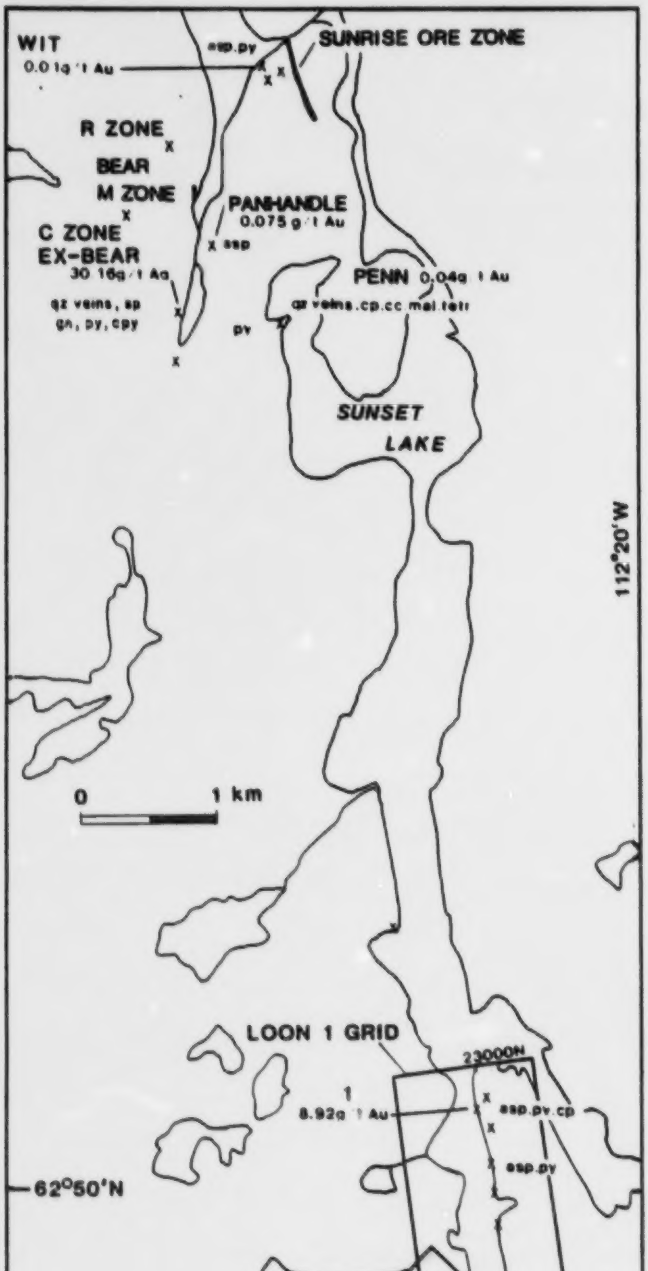
WIT
0.01g/t Au
asp.py
SUNRISE ORE ZONE
R ZONE
BEAR
M ZONE
PANHANDLE
0.075 g/t Au
C ZONE
EX-BEAR
30.16g/t Au
x asp
qz veins, sp
gn, py, cpy
py
PENN 0.04g/t Au
qz veins.cp.cc.mal.tetr
SUNSET
LAKE
112°20'W
0
1 km
LOON 1 GRID
23000N
1
8.92g/t Au
asp.py.cp
asp.py
62°50'N
3
4.82g/t Au
asp.py
LOON 2 GRID
22.36g/t Au
py.asp
4
2.74g/t Au
cp.gn.sp
py
5
20000N
po
50000N
30000E

FIGURE 8-75: Sunset Lake area showings, assays and grids.

LEGEND

▬ Surface trace of massive sulphide lens

x Showing. Showings are labeled by name and number. Assays are the highest assay collected during 1986-87 sampling.

py	pyrite	mal	malachite
asp	arsenopyrite	tetr	tetrahedrite
cp	chalcopyrite	qz	quartz
sp	sphalerite	cc	chalcocite
gn	galena	po	pyrrhotite

☐ Grid outline

CURRENT WORK AND RESULTS

In 1986, ten holes, 542 m, tested the gold potential of silicified, brecciated, arsenopyrite-bearing quartz-biotite schists and massive pyrrhotite in iron formation of the C zone. Intersections assayed 10.6 g/t Au over 1.7 m, 5.3 g/t Au over 4.1 m, 7.0 g/t Au over 2.9 m and 6.8 g/t Au over 2.8 m. This was followed by 1:5000 scale geological mapping and prospecting along cut grids during which 79 rock samples were collected for gold assay, 6 were also assayed for silver and 2 for base metals and soil samples were collected which were analysed for gold, silver, lead, zinc and copper. Best gold assays came from a northeast-trending shear zone, the R zone, ranged up to 11.66 g/t Au. Assays from the massive sulphide M zone included 5.36% Zn, 1.6% Pb, 0.07% Cu, 48 g/t Ag, and 0.3 g/t Au (Fig. 8-75). Soil sampling delineated a 150 m long zinc-lead anomaly, a 50 m long silver anomaly and a patchy copper anomaly paralleling stratigraphy over the M zone.

Following the December 1987 announcement of the Sunrise polymetallic massive sulphide discovery on Aber/Highwood's adjacent claims and the realization that the BEAR claims probably host a fault extension of the Sunrise deposit, preparations were made to explore for volcanogenic massive sulphides.

GIVER CLAIMS

Giant Yellowknife Mines Ltd.	Gold
Bag 3000	85 I/15,16
Yellowknife, NWT, X1A 2M2	62°53'N, 112°30'W

REFERENCES

Henderson (1985); Lambert (1988).
DIAND assessment reports: 082551, 082729.

PROPERTY

GIVER 1-2.

LOCATION

The property is 113 km east-northeast of Yellowknife and extends from the northeast end of Giver Lake to Amacher Lake (Fig. 8-72).

HISTORY

The area was staked in 1964 to cover an aeromagnetic anomaly and a detailed airborne magnetic survey was flown in 1966. Giant Yellowknife Mines Limited staked the area as the GOOD 1-3 claims in 1979; however, the assays of 70 samples collected from various gossans and iron formations were low. GIVER 1 was recorded for Asamera Inc. in April 1985 when iron formation was recognised to be the source of the magnetic anomaly. GIVER 2 was added in July of 1985 to cover the projection of an iron formation between Giver and Amacher lakes. Work was done in 1985 by Kelmet Resources and in 1986 by Giant Yellowknife Mines as partners in joint venture with Asamera Inc.

DESCRIPTION

The property is underlain by north-northeast-trending amphibolite-grade metavolcanics of the Beaulieu volcanic belt intercalated with pyritic schists and magnetite-quartz iron formation. The volcanics are bordered on the west by cataclastic gneisses of the Sleepy Dragon Complex. Blue-grey, banded, locally folded, magnetite-quartz iron formation varies along strike from one to several parallel to subparallel units ranging up to 25 m in width. The aeromagnetic anomaly has a strike length in excess of 9 km. Within the volcanics numerous gossans have been called iron formation and have been prospected for gold. Gossans are up to 65 m long and up to 12 m wide and contain disseminated pyrite, pyrrhotite and minor chalcopyrite together with quartz.

CURRENT WORK AND RESULTS

Work done in 1985 is described here because it was filed after the 1984-85 Mineral Industry Report was written. Nine chip samples of pyrite-pyrrhotite-rich iron formation and 13 soil samples from two lines perpendicular to the magnetic anomaly that trends northeast between Giver and Amacher lakes were collected for analysis.

Work in 1986 focused on evaluating the gold potential of a drag-folded unit of banded sulphide iron formation on GIVER 2 called the BIF zone. Six trenches were excavated and nine samples assayed from trace to 0.69 ppm Au. Geologic mapping at 1:2000 scale showed that the outcrop pattern is complex and that two, and possibly three, iron formations crop out irregularly along a strike length of 175 m and across a stratigraphic width of 65 m.

SUNSET LAKE PROJECT

Noranada Exploration Co. Ltd.
(N.P.L.)
4 - 2130 Notre Dame Ave.
Winnipeg, Man., R3H 0K1

Gold
85 I/16
62°50'N, 112°22'W

REFERENCES

Henderson (1985); Lambert (1988).

DIAND assessment reports: 017980, 061716, 080112, 081654, 081678, 081794, 081902, 082547, 082670.

PROPERTY

FIR 1-7, LOON, COWBOY, EX-BEAR and NORTH claims.

LOCATION

FIR 1-7 and LOON form a southern group of claims at the south end of Sunset Lake. A smaller northern group, at the north end of Sunset Lake, COWBOY, EX-BEAR and NORTH claims (Fig. 8-72), is just south of the Sunset volcanogenic massive sulphide deposit, 110 km east of Yellowknife.

HISTORY

The area has been prospected since the 1930's. In 1938 the Thompson Prospecting Syndicate discovered gold in the Alice shear zone and staked the ALICE 1-22 claims. The Alice shear is covered by LUCKY claim, 800 m north of the LOON claim. In 1945 Sunset Yellowknife Mines Limited acquired the ALICE claims, and between 1945 and 1947, 990 m were drilled (DIAND assessment report 061716) and a shaft was sunk on the Alice shear zone. Between 600 and 900 m of drilling from drifts on the 38-m level delineated an auriferous quartz shear zone cross-cutting cherty interflow sediments. It strikes north-northwest for 300 m and is less than 0.5 m wide. Giant Yellowknife Mines Ltd. optioned the property in 1966 and drilled 143 m in four holes on shears to the west of the shaft. The best intersection was 2.9 ppm Au across 0.46 m (DIAND assessment report 017980). In 1971 Teck Corp. and Great Plains Development had EM surveys flown over the area. In 1976 United Cambridge Mines Limited acquired the Alice property and conducted geophysical surveys (DIAND assessment report 080112). The area around the Alice shear zone was staked as the LUCKY claim by Mr. J. Arden in 1981 and was optioned to Ark la Tex Industries Ltd. in 1985 (DIAND assessment reports: 081675, 081654, 081794).

In 1983, Noranda staked a number of claims based on the 1971 airborne EM survey including FIR 1-7. In fall 1986, NORTH, LOON, COWBOY, and EX-BEAR claims were added following prospecting of felsic volcanic units and structural targets for gold.

DESCRIPTION

The two claim groups are underlain by dacitic to andesitic lavas, pillow breccias, tuffs, breccias, hyaloclastites and volcaniclastic sediments of the Alice Formation interbedded with rhyolite domes, flows and tuffs. Basaltic pillow lavas, breccias and volcaniclastic sediments of the Sunset Lake Basalt are also exposed. At the southern end of the claim block the volcanics are overlain by Burwash sediments. Metamorphic grade is dominantly greenschist with amphibolite-grade rocks on the southwest claims (Fig. 8-72). The rocks are isoclinally folded about north-trending fold axes and a later open fold with a northwest-trending axis is recognised in the southern claim block. In the northern claim group altered felsic volcanic rocks host pyrite, arsenopyrite and base metal showings including sphalerite, chalcopyrite and galena in quartz veins on EX-BEAR and chalcopyrite, malachite and tetrahedrite in quartz veins at the Penn showing on the NORTH claim (Fig. 8-75).

CURRENT WORK AND RESULTS

Both claim blocks were prospected and mapped during 1986 and several showings were sampled (Fig. 8-75).

FIR 1-7, LOON southern claim block: in 1987 two overlapping grids of 31.6 line-km were established over which winter geophysical VLF EM and magnetometer surveys were completed (Fig. 8-75). Conductors associated with magnetic anomalies were identified. Mapping of the grids found five showings (Fig. 8-75):

1. Frost-heaved boulders of sheared sericite schist are cross-cut by locally vuggy quartz veins with calcite, pyrite and arsenopyrite.
2. Sheared to talcose, carbonate-altered, mafic volcanics contain, on average, 3% and locally up to 15% fine pyrite disseminated along foliation planes and concentrated in vugs. The shear is adjacent to an oxide-facies iron formation.
3. A sheared, graphitic unit contains up to 50% pyrite as well as calcite and arsenopyrite.
4. Base metal showing contains chalcopyrite, sphalerite and galena.
5. Exposed in a trench at the south end of Sunset Lake, sheared volcanics similar to (2).

Further mapping was completed outside the grid areas.

NORTH, COWBOY, EX-BEAR northern claim group: four showings are identified (Fig. 8-75):

1. The EX BEAR showing is exposed in trenches where quartz stringers containing up to 5% sphalerite, 1% galena, 2% pyrite and 2% chalcopyrite cross-cut quartz-pyrite-sericite schist. Best assays for precious metals are 0.17 ppm Au, and 30.16 ppm Ag.
2. The Penn showing is stratabound. Felsic volcanics carry minor base metal sulphides and trace gold.
3. The Wit showing, adjacent to a sheared quartz-feldspar porphyry body, is hosted in rhyolite lapilli carrying 1% arsenopyrite and pyrite in the matrix. Gold assays range from nil to 0.010 ppm.
4. The Panhandle showing is a silicified zone within intermediate tuff or volcaniclastic sediment. The zone parallels a north-northeast-trending fault and contains acicular arsenopyrite. Assay results range from trace to 0.075 ppm Au.

SHEET 1 CLAIM

Asamera Minerals Inc.	Gold
2100, 144 - 4th Ave. SW	85 I/16
Calgary, Alta., T2P 3N4	62°52'N, 112°22'W

REFERENCES

Henderson (1985); Lambert (1988).
DIAND assessment report: 082530.

PROPERTY

SHEET 1.

LOCATION

The claim is 105 km east-northeast of Yellowknife, on the west side of Sunset Lake.

HISTORY

Part of the claim was staked in the mid-1940's as the GE, ALLAN and BEAR claim groups. No work was recorded and the claims lapsed. Asamera staked the SHEET claim in 1985 and exploration of the property is under joint venture with Kelmet Resources Ltd. and Giant Yellowknife Mines Ltd. During summer 1985 the claim was mapped at 1:15 840 and 57 rock and soil samples were assayed for gold and arsenic.

DESCRIPTION

The area is underlain by Beaulieu volcanic belt rocks comprising interbedded mafic flows, mafic tuffs and volcaniclastics of the Alice Formation and discontinuous felsic rocks.

CURRENT WORK AND RESULTS

The claim was mapped at 1:5000. Carbonate veinlets within sheared basalts and quartz-eye felsic tuffs were identified. South of SHEET 1 a highly fractured arsenopyrite-bearing and quartz-rich zone was discovered containing anomalous amounts of gold.

FEDED CLAIM

Noranda Exploration Co. Ltd.	Gold
4 - 2130 Notre Dame Ave.	85 I/16
Winnipeg, Man., R3H 0K1	62°47'N, 112°28'W

REFERENCES

Henderson (1985); Lambert (1988).
DIAND assessment report: 082587.

PROPERTY

FEDED.

LOCATION

The property is 100 km east-northeast of Yellowknife.

HISTORY

The gold showing was first staked in 1939 and has been staked and restaked several times as the FED and ED claim and prospected by trenching. The FEDED claim was staked by Noranda in May 1981, geologically mapped at 1:10 900 and prospected. In 1982 two grids were established over the auriferous quartz vein for control of 1:2000 scale mapping and sampling. Magnetometer, VLF EM and radiometric surveys were conducted over the grids.

DESCRIPTION

The western part of the property is underlain by pinkish grey, medium- to coarse-grained Amacher Granite, which intrudes mafic volcanics of the Sunset Lake Basalt exposed over the eastern part of the claim. Gold is in an east-trending quartz vein and silicified zone in the granite near the volcanic contact. The mineralised zone is 500 m long and up to 35 m wide and contains disseminated sulphides including pyrite, sphalerite, galena, chalcopyrite and pyrrhotite.

CURRENT WORK AND RESULTS

In 1987, 21 days were spent mapping and prospecting. Sixteen rock samples were taken, including ten from the quartz vein and six from the surrounding area. Assays ranged from trace to 2.53 g/t Au.

SHORTY Claim

Continental Pacific Resources
830, 355 Burrard St.
Vancouver, B.C., V6C 2G8

Lithium, Beryllium,
Tin, Tantalum
85 I/11
62°33'N, 113°28'W

REFERENCES

Henderson (1985); Jolliffe (1944); Kretz (1968); Lasmanis (1978); Mulligan (1965); Wise *et al.* (1985).
DIAND assessment reports: 062264, 080274, 082128.

PROPERTY

SHORTY 1 (334.4 ha).

LOCATION

The property is 44 km east-northeast of Yellowknife and 1 km east of Hidden Lake (Fig. 8-76). The Ingraham Trail is 5 km south of the claim.

HISTORY

In 1975 Canadian Superior Exploration Ltd. evaluated the Greg showing, which had been trenched, and reserves were estimated to be 3.8 Mt grading 1.24% Li_2O to a depth of 160 m (DIAND assessment report 080274). The GREG claims lapsed and the showing was staked as the SHORTY 1 in December 1983.

DESCRIPTION

The pegmatite dyke, 390 m long, averaging 23 m wide, trends northeast and cross-cuts northwest-striking, steeply dipping, arenaceous to argillaceous beds of the Burwash Formation (Henderson, 1985). It is a simple pegmatite of quartz, feldspar, muscovite and spodumene with traces of cassiterite, tantalite and beryl. Ferrocolumbite is the dominant niobium-tantalum mineral, forming bladed crystals in cleavelandite + quartz + muscovite ± spodumene aggregates (Wise *et al.*, 1985).

CURRENT WORK AND RESULTS

In 1986 continuous chip samples, mostly 1.5 m long, were collected from seven trenches and analysed for lithium, beryllium, tin and tantalum. Grab samples were collected from the north end of the dyke, which has not been trenched. Results verified the tonnage and grade figures calculated by Canadian Superior (Table 8-7).

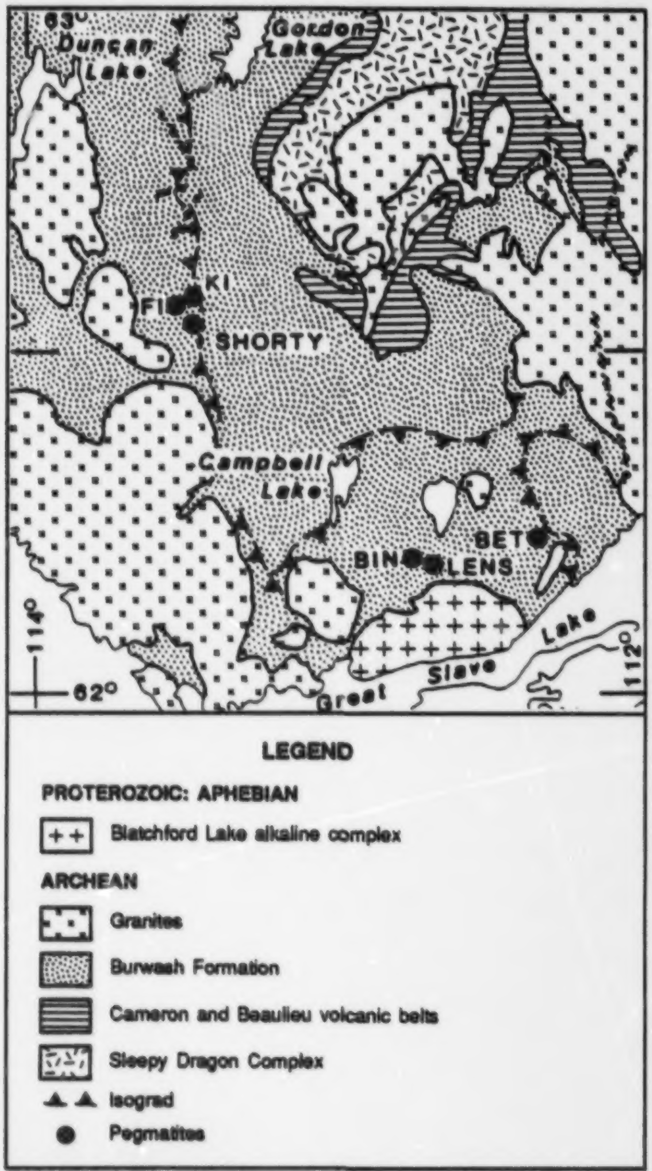
63°
Duncan Lake
Gordon Lake
FI
KI
SHORTY
Campbell Lake
BIN
LENS
BET
114°
62°
Great Slave Lake
112°
LEGEND
PROTEROZOIC: APHEBIAN
Blatchford Lake alkaline complex
ARCHEAN
Granites
Burwash Formation
Cameron and Beaulieu volcanic belts
Sleepy Dragon Complex
Isograd
Pegmatites

FIGURE 8-76: Location of Shorty, FI, KI, BIN, Bet and Lens pegmatites.

FI, KI Claims

Equinox Resources Ltd.
900 - 625 Howe St.
Vancouver, B.C., V6C 2T6

Lithium
85 I/11
60°35'N, 111°30'W

REFERENCES

Henderson (1985); Hutchison (1955); Jolliffe (1944); Kretz (1968); Lasmanis (1978); Mulligan (1965); Wise *et al.* (1985).
DIAND assessment report: 082495.

PROPERTY

Two separate blocks, FI lease, and KI lease and adjoining KI 6 claim.

TABLE 8-7: *Reserves for pegmatites on the FI and KI claims*

Pegmatite	Estimated Size (m)	Estimated reserve (Mt)	Grade (% Li_2O)
Bin[1]	122 X 12	0.09	1.75
Lens[1]	37 X 12	0.093	1.97
Bet[1]	100 X 9	0.039	2.00
Shorty (Greg)[2]	390 X 23	3.8	1.24
FI Main[2]	950 X 10-25	2.6	1.54
FI SW[2]	800 X 35	4.5	1.46
KI[2]	800 X 10-15	2.0	1.4

[1] Reserves from Lasmanis 1978. Calculations assume width and grade to 152 m depth.

[2] Reserves from assessment files. Calculations assume width and grade to 160 m depth.

LOCATION

Both properties are about 50 km northeast of Yellowknife. The FI property is 2.5 km northeast of Hidden Lake and the KI claims are 2.0 km northeast of the FI property (Fig. 8-76). The winter road to the Thompson-Lundmark gold mine passes through the western part of the FI property.

HISTORY

In 1956, General Lithium Corp. optioned the FI Southwest Dyke and carried out trenching and 258 m of diamond drilling. The FI Main Dyke was held by Affiliated Lithium Mines Ltd. at that time. In 1975, Canadian Superior Explorations Ltd. began exploration on the FI and KI properties as part of a regional evaluation of pegmatites in the Yellowknife region. Both properties were mapped and sampled in detail. In 1978, three holes, 234 m, were drilled to test the KI property. In 1979, six trenches were blasted on the FI Main Dyke and were sampled as were trenches on the FI Southwest Dyke. Reserves of the FI Southwest Dyke, the FI Main Dyke and the KI are reported in Table 8-7.

The property was acquired by Erex International Ltd. and in 1985 by Equinox Resources Ltd. who holds a 49% interest in the FI and KI properties under the terms of a property sale and option agreement. The KI 6 claim was added to the KI property in 1985.

DESCRIPTION

Pegmatite dykes on FI and KI are simple pegmatites of feldspar and quartz, with lesser spodumene, the principal lithium mineral. They are hosted by nodular quartz-biotite schist of the Burwash Formation. The FI property contains two large pegmatite dykes:

1. The FI Southwest Dyke (Table 8-7) forms a 5 to 10 m high ridge approximately 35 m wide and is easily traced on surface for 800 m. The dyke strikes 30° and dips vertically. Contacts are sharp and are marked by a 0.3-0.5 m wide chill zone. Within the dyke alternating bands of aplite and pegmatite are common; the western side of this dyke has a higher proportion of aplite. Pegmatite contains most of the spodumene as subparallel crystals 5-10 cm long. The spodumene content of the Southwest Dyke averages 20% decreasing to about 10% in its northern third. The northern part of the Southwest Dyke contains up to 30% hornfels rock fragments, concentrated along the eastern margin.
2. The FI Main Dyke (Table 8-7) can be traced for 950 m and has a maximum thickness of 25 m, decreasing to about 10 m in the narrowest parts of the southeast limb. Overall, the mineralogy and lateral banding of the Main Dyke are very similar to the FI Southwest Dyke, but with more variation in the spodumene content. The narrow dykes extending southeast of the main dyke are more aplitic and have a lower spodumene content.

On the KI claim, the KI Dyke (Table 8-7) crops out over an 800 m northwest strike length, is 10-15 m wide, dips steeply south and contains 20-25% spodumene, with minor muscovite.

CURRENT WORK AND RESULTS

In January 1987, 1380 kg of pegmatitic material was collected by blasting on the FI Southwest pegmatite, the FI Main pegmatite and the KI pegmatite. Metallurgical testing of the material by Bacon, Donaldson and Associates Ltd. indicated that a spodumene concentrate could be produced by a combination of gravity concentration and floatation. Tests to produce a lithium carbonate product demonstrated that a high purity product could be made using the roast and acid leach method. Potential by-products were also investigated. It was found that mica, feldspar and sodium sulphate could be produced.

Initial whole rock analysis and grindability tests performed on the samples indicated that there was very little variation between samples. Within the areas of calculated reserves considered for development, assays averaged 1.46% Li_2O with little variation.

BIN 1, BET 1, 2 AND LENS 1 Claims

Equinox Resources Ltd.	Lithium, Niobium,
900, 625 800 Howe St.	Tantalum
Vancouver B.C., V6C 2T6	85 I/1,2
	62°13'N, 112°45'W
	62°13'N, 112°18'W
	62°12'N, 112°41'W

REFERENCES

Lasmanis (1978); Seaton (1978); Henderson (1985); Wise *et al.* (1985).

DIAND assessment reports: 080278, 080279, 080280, 081132, 081875, 081877, 081878.

PROPERTY

Three separate claim blocks, BIN 1 (18.6 ha), LENS 1 (21.7 ha) and BET 1 and 2 (42.8 ha).

LOCATION

The claim groups are 87 to 112 km south-east of Yellowknife (Fig. 8-76).

HISTORY

Work prior to 1975 is summarised by Seaton (1978). Pegmatite on the BET claims was mined intermittently between 1947 and 1954 for tantalum and lithium under the name BEST BET. BIN 1, LENS 1 and BET 1 and 2 were staked in 1975 for Canadian Exploration Ltd. during a regional evaluation of pegmatites (DIAND assessment reports: 080278, 080279, 080280). In 1980, BET 1 and 2 were transferred to Cominco Ltd. who conducted geochemical testwork (DIAND assessment report 081132). In 1985, the three claim groups were transferred to Equinox Resources Ltd.

DESCRIPTION

The claims are underlain by pelitic and psammitic schists of the Burwash Formation. The pegmatites are simple spodumene-bearing types. The Bin pegmatite also contains cassiterite and the Bet pegmatite ferrocolumbite and ferrotantalite.

CURRENT WORK AND RESULTS

Old trenches were cleaned out to examine exposures for tantalum-bearing minerals.

INDIAN MOUNTAIN LAKE - BENJAMIN LAKE SUPRACRUSTAL BELT

The Indian Mountain Lake - Benjamin Lake supracrustal belt extends 65 km north from the east arm of Great Slave Lake. It has a maximum width of 25 km at its southern end and tapers northward to a sinuous "tail" of metasediments at its northern end. The belt is flanked by granitic and migmatitic rocks. Volcanic rocks include two contiguous belts on the west shore of Indian Mountain Lake and extending north 20 km, and another belt 20 km long from Great Slave Lake, west of Suse Lake and north 20 km. The area was mapped by Henderson (1944) and by Stockwell and others (1968) at 1:253 440, and that part covered by NTS 75 M/2 by Heywood and Davidson (1969) at 1:50 000.

The region has been extensively prospected for base metal deposits since the late 1940's and numerous small showings of zinc, copper and silver have been located in the volcanics and sediments. Indian Mountain Metal Mines discovered BB and Kennedy Lake zones in 1948 and Susu Lake zone (Fig. 8-77) in 1966.

BRI and GYM

Giant Yellowknife Mines Ltd.	Gold
Bag 3000	75 M/2
Yellowknife, NWT, X1A 2M2	63°07'N, 110°55'W

REFERENCES

Heywood and Davidson (1969); Johnson (1974).
DIAND assessment report: 082488.

PROPERTY

BRI 1-7, GYM 1-4.

LOCATION

The claims are 195 km east-northeast of Yellowknife in the Brislane Lake - Indian Mountain Lake area, about 25 km north of Thompson Landing on the east arm of Great Slave Lake.

HISTORY

The area was explored for base metals in the late 1940's by Indian Mountain Metal Mines and Initiative Exploration Ltd. The area was again explored for base metals during 1955-65 and 1970-74. The BRI and GYM claims were staked in 1986 to cover a syngenetic gold target identified in 1985 samples of old core on BRI 1 which returned encouraging assays. The BRI 1 claim covers three copper-zinc zones previously delineated by Indian Mountain Metal Mines. The BB Lake and Kennedy Lake base metal zones are just south of the claims. The BRI and GYM claims are under a joint venture agreement between Giant, Asamera Minerals Inc. and Kelmet Resources Ltd.

DESCRIPTION

North-trending massive and pillowed flows are overlain by a narrow band of andesitic to dacitic flows and tuffs and a thick sequence of felsic flows, tuffs and fragmentals. These are, in turn, overlain by quartz-biotite-cordierite schists representing metasediments. The Indian Mountain Lake belt is draped around a tonalite body. The claims cover a large portion of the volcanic-sediment contact east (Brisbane Lake) and west (Indian Mountain Lake) of the tonalite, as well as numerous base metal sulphide showings, mainly pyrite, pyrrhotite, chalcopyrite, sphalerite and galena, within the felsic pyroclastic and carbonate formations. Rocks are metamorphosed to amphibolite grade and in the southern part of the property are strongly tectonised and migmatised. Three felsic fragmental domes, which form hills, are recognised on the property. These were eruptive centres and are flanked by thick sequences of laterally fining felsic fragmentals and volcaniclastics. The fragmental sequence has been intensely carbonatized, and coarsely crystalline carbonate units previously described as limestone or carbonate exhalite were re-interpreted to represent severely altered felsic volcanics.

CURRENT WORK AND RESULTS

In May 1986 a DIGEM III electromagnetic/resistivity/magnetic survey with 100 m line spacing was flown over the claims. Numerous magnetic and conductive anomalies were outlined which corresponded to massive sulphide showings and large areas of disseminated pyrite and pyrrhotite. Three areas selected as potential gold targets were characterised as having an anomalous magnetic signature and having variable but generally high total field VLF EM and low resistivity. The targets are on the east side of Brislane Lake, south of the narrows and on the south and west shore of Brislane Lake including the Taco Islands.

In 1986 geologic mapping of the property at 1:10 000 was completed together with collection of 109 samples for lithogeochemical analysis. During prospecting 422 grab, chip and channel samples were collected, including samples from 2 newly blasted trenches and from 5 old trenches. The core drilled in 1974 was re-logged and sampled. From these assays it was observed that gold enrichment is associated with chalcopyrite and pyrite. Four grids were established for a soil geochemical survey. Of the 2125 soil samples collected, only 201 which were from areas with coincident geophysical anomalies were analysed for gold, arsenic, tin, tungsten, copper and zinc.

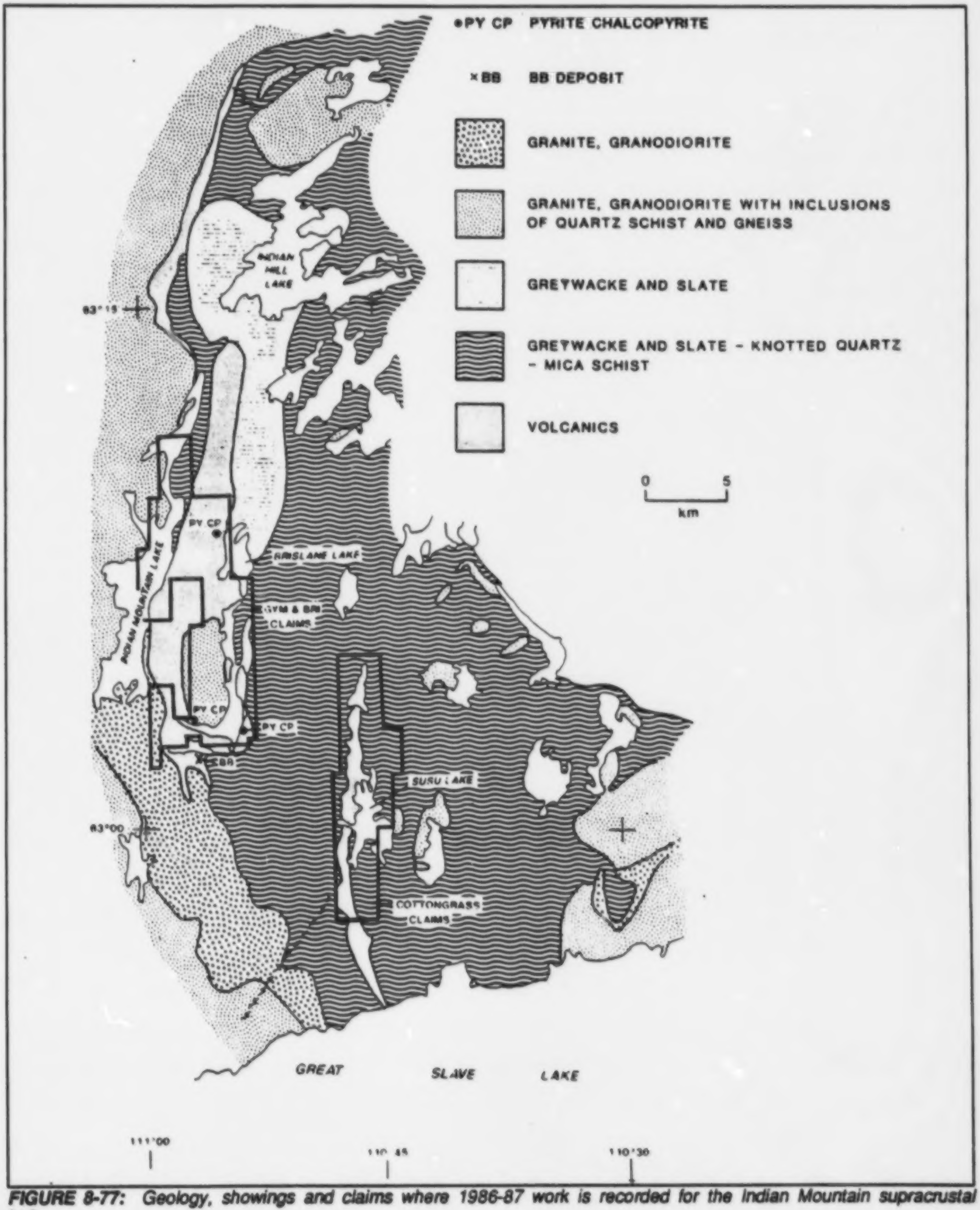
●PY CP PYRITE CHALCOPYRITE
×BB BB DEPOSIT
GRANITE, GRANODIORITE
GRANITE, GRANODIORITE WITH INCLUSIONS OF QUARTZ SCHIST AND GNEISS
GREYWACKE AND SLATE
GREYWACKE AND SLATE - KNOTTED QUARTZ - MICA SCHIST
VOLCANICS
0
5
km
INDIAN HILL LAKE
63°15'
INDIAN MOUNTAIN LAKE
PY CP
BRISLANE LAKE
GYM & BRI CLAIMS
PY CP
PY CP
BB
SUSU LAKE
63°00'
COTTONGRASS CLAIMS
GREAT
SLAVE
LAKE
111°00
110°45
110°30

FIGURE 8-77: Geology, showings and claims where 1986-87 work is recorded for the Indian Mountain supracrustal belt.

COTTONGRASS

BHP-Utah Mines Ltd.
1600 - 1050 W. Pender St.
Vancouver, B.C., V6E 3S7

Gold, Base Metals
75 L/15; 75 M/2
63°-63°05'N
110°48'-110°44'W

REFERENCES

Heywood and Davidson (1969).
DIAND assessment report: 082714.

PROPERTY

COTTONGRASS 1-6.

LOCATION

The claims are on Susu Lake, 200 km east-northeast of Yellowknife and 20 km north of Great Slave Lake.

HISTORY

The area has been extensively prospected since the late 1940's. The Susu Lake copper zone, 800 m west of the claim block, was discovered in 1966 by Indian Mountain Metal Mines. The COTTONGRASS claims were recorded in October 1986 by BHP-Utah Mines Ltd. following 1986 reconnaissance mapping and sampling which found anomalous gold and base metal content in 49 rock chip samples collected along a mineralised rhyolite-metagreywacke contact in the Indian Mountain belt.

DESCRIPTION

The property covers part of the Indian Mountain volcanic belt (Fig. 8-77; Heywood and Davidson, 1969). The rocks are believed to be metamorphosed equivalents of rhyolite, limestone and felsic breccia now represented as a 9.7 km long lens of fine-grained, massive to weakly foliated, quartz-feldspar-biotite granulite locally interbedded with calcsilicate, and hornblende-garnet granulite. These are enclosed by quartz-biotite schists and quartz-biotite-cordierite-knotted schists representing metamorphosed greywackes. The metasediments are isoclinally folded and quartz veined. In all units foliation strikes 135°-165° and dips 45°-60° east. Two dextral strike slip faults cross-cut the area with carbonate fault breccias and siliceous mylonite surrounded by alteration zones tens of metres wide.

CURRENT WORK AND RESULTS

In 1987, 36 days were spent on the property. An 18.7 line-km flagged grid was established over the metasedimentary-metavolcanic contact and total field magnetometer and VLF EM surveys were conducted over the grid totalling 15 line-km and 13 line-km respectively. The property was geologically mapped at 1:5000 scale and 83 rock and 5 soil samples were collected. Highest results were 950 ppb Au, 2059 ppb Zn, 2611 ppm Cu, and 4015 ppm Pb. Anomalous concentrations of gold, copper and zinc were traced sporadically for 9 km within 20 m of the eastern volcanic-sedimentary contact. Close to the contact, within the metasediments, foliation is typically more pronounced and quartz veining is more intense. Quartz veining and silica flooding with disseminated to massive pyrite, pyrrhotite, sphalerite and chalcopyrite is typical of calcsilicate rocks interbedded with the rhyolite at the sediment contact.

COURAGEOUS LAKE-MACKAY LAKE VOLCANIC BELT

The Courageous Lake-MacKay Lake volcanic belt is 240 km northeast of Yellowknife. It is a steeply dipping, east facing, homoclinal succession of north-northwesterly trending volcanic rocks and sediments, 70 km long and 2 to 7 km wide. The belt is conformably overlain by tracts of turbiditic sediments to the east and bounded by granitoid intrusions to the west. Metamorphic grade is greenschist facies increasing to amphibolite facies near the volcanic-granitoid contact.

GSC mapping of the Courageous Lake-MacKay Lake volcanic belt at 1:253 440 scale was by Henderson (1944) who completed the MacKay Lake sheet and Folinsbee (1949) who completed the Lac de Gras sheet. The Courageous Lake-Matthews Lake area was mapped by Folinsbee and Moore (1950) and Moore (1951) at 1:18 000 scale and by Moore (1956) at 1:24 000. Moore's 1956 coverage was extended to the north and south in 1978 and 1979 by Dillon-Leitch (1979, 1981, 1984), sponsored by DIAND.

Moore (1956) and Dillon-Leitch (1981) have described the Archean Yellowknife Supergroup rocks of the Courageous Lake-MacKay Lake area in detail: Two cycles of volcanism are recorded, Cycle One and Cycle Two (Table 8-8; Dillon-Leitch, 1981). Cycle One and Two basalts range in thickness from 1 to 5 km and comprise massive, pillowed and locally feldspar-

TABLE 8-8: STRATIGRAPHIC SUCCESSION IN THE COURAGEOUS-MACKAY LAKE AREA, after Dillon-Leitch (1981).

PROTEROZOIC
- **Diabase**
- **Great unconformity**
- **Pegmatite**
- **Granite**
- **Intrusive contact**

ARCHEAN
- **Yellowknife Supergroup**
  - Turbidites:
    - greywacke and slate
    - granitoid and volcanic conglomerate
    - volcanogenic chert
  - CYCLE 2
    - Rhyolite to dacite:
      - domes or massive flows
      - volcaniclastics
      - quartz-feldspar intrusions
    - Andesite:
      - massive flows, pillowed flows
      - volcaniclastic breccia
    - Basalt:
      - massive flows, pillowed flows
      - feldspar phyric massive flows
      - feldspar phyric pillowed flows
      - flattened pillows
  - CYCLE 1
    - Rhyodacite:
      - breccia
      - intervolcanic conglomerate ± mudstone
    - Basalt:
      - massive flows, pillowed flows
      - minor pillow breccia
- **? Unconformity ?**
- **Basement ?**
  - Granodiorite
  - Tonalite
  - Trondhjemite

phyric basalt flows. Massive flows, predominant in the northern part of the belt, are up to 200 m thick and laterally continuous for up to 3 km. Pillowed flows are found in the southern part of the belt. Pillow breccias and hyaloclastites are found locally, but are poorly preserved, commonly deformed and difficult to recognize. Pillowed flows range from 50 m to greater than 250 m thick, although estimates may be exaggerated where pillow-breccia units are not recognized. Porphyritic basalts form lenses of feldspar-phyric massive and pillowed flows 100 to 200 m thick, concordant to the north-striking regional schistosity.

Amygdaloidal andesites, exposed in the northern part of the belt, are restricted to Cycle Two. Pillowed flows, and subordinate massive flows and rare volcaniclastic breccias are intermixed with basalts. Massive flows range from 30 to 50 m and pillowed flows are up to 200 m thick. Breccias are laterally discontinuous, up to 200 m thick and contain ash to lapilli size, flattened fragments.

Felsic volcanics range from locally vesicular massive rhyolitic flows, predominant in Cycle One, to rhyolitic and dacitic pyroclastics represented in Cycle Two. Facies changes are rapid. Massive flows up to 600 m thick, grade vertically and laterally into agglomerates 5 to 100 m thick and lapilli tuff 50 to 200 m thick. Fragmental units are commonly monolithic but fragments can show differing internal textures such as vesicular to non-vesicular and quartz- or feldspar-phyric. In many places, fragments are flattened, elongated, poorly sorted and exhibit internal fracturing.

Intervolcanic sediments comprise slaty mudstones to biotite phyllites, 10 to 100 m thick and polymictic conglomerates, 30 to 50 m thick. Mudstones are thinly laminated on a scale of millimetres and contain abundant euhedral pyrite. They are found within Cycle One volcanics near the granitoid contact and minor amounts occupy the top of Cycle Two, less than 1 km from the upper volcanic-sediment contact. North of Courageous Lake, mudstone is overlain by a unit of conglomerate 1.5 km in strike length. Thin pyritic cherty layers in the south and eastern portions of the belt are thought to represent the close of volcanism and possible exhalitive activity (Dillon-Leitch, 1981). The belt grades into proximal-basin facies turbiditic sediments derived from the felsic cap of the volcanic pile.

Dillon-Leitch (1981) cites evidence of four phases of regional deformation. The east-facing homocline and marginal synclines developed during the first phase of deformation, possibly resulting from the intrusion or remobilization of granitoid bodies to the west. Three subsequent phases of sub-horizontal compressive deformation imposed steeply north plunging tight to isoclinal F_{2A} folds in the sediments, east to northeast F_{2B} folds near the southeast pluton and open to tight, moderately to subvertically northwest plunging F_2 folds. A pervasive regional foliation trends 330° to 355° and dips steeply.

Gold was first discovered in 1939 by Territorial Exploration Ltd. field parties, under the direction of Dr. W.L. Brown. Brown mapped north and south of Courageous Lake and discovered a number of showings including the T.M.K. vein. The vein assayed 67.8 ppm Au across 50 cm for a strike length of 35 m (DIAND assessment report 082385). In 1946, Tredway Gold Mines Ltd. drilled 379 m to test the vein, but results were inconclusive.

From 1943 to 1945 exploration centred on the Courageous Lake area and the W.A., MINT (discussed under the MOG claims), TARTAN, O.K., ARCTIC, K.B., J.B., and F.N. groups were recorded (DIAND assessment report 082385). In 1943 the Newnorth South and North properties were staked by Austin Dumond on either side of the T.M.K. group and were acquired by Newnorth Gold Mines Ltd. in 1945. The South Group was explored by trenching and three diamond-drill holes totalling 86 m. The North Group was explored by trenching and 725 m of diamond drilling. Five gold showings including the Sour Lake and Jax showings were discovered on the North Group. During the mid 1940s, exploration expanded to the south. The Saucer Lake and Perrson vein showings, auriferous quartz veins containing arsenopyrite, pyrite and pyrrhotite, were discovered and staked as the ROMA and JEJA claims in 1945.

In 1945 JEJA 1-6 were staked by J. Matthews and SALERNO 1-8 were staked by F. Salerno and M. Mitto to protect auriferous quartz veins on the east and south side of Matthews Lake respectively. Salmita Northwest Mines Ltd. was incorporated in late 1945 to develop the SALERNO property. The JEJA claims were subsequently optioned by Trans-American Mining Corporation who added REP 1-12 and MAD 1-18 to the group and formed Bulldog Yellowknife Mines Ltd. in 1947 to hold the claims.

The two properties were sporadically developed after the 1940s. The southern gold showing was brought into production as the Tundra Mine. Between 1964 and 1968 the Tundra Mine produced 3251.5 kg of gold and 644.5 kg silver from 170 285 t of ore. The Salerno gold showing became the Salmita Mine, which operated from 1983 to 1987 and produced 5624.3 kg of gold and 1015.1 kg of silver from 216 627 t of ore (Caine, 1987).

The Red 24 claim, immediately south of the Tundra Project discussed in this section and approximately 3.5 km north of the Salmita Mine, was staked in 1973. Drilling on the claim between 1983 and 1985 outlined 13 000 t grading 19.5 ppm. A pit was excavated in 1986 and 5700 t of refractory ore grading 18.1 ppm were mined from four benches. Mining was discontinued as poor recovery rates (65%) made it uneconomic to mine the remaining 7200 t of ore, accessible only from underground. In 1987, Giant Yellowknife Mines and joint venture partners, Giant Bay Resources, completed a 10 tpd bioleach test (see Chapter 2; NMI, 76 /3 Au1).

Most gold deposits can be grouped into two types: One type is auriferous shear zones with finely disseminated sulphides, including arsenopyrite (Tundra Project; Secum and KM groups; ALPHA group; T.M.K. groups). The other type is auriferous siliceous zones/quartz veins with 3 to 5% sulphide (T.K. BS claims; MINT group; Kennedy showings, Newnorth south group; Jax Lake) at the volcanic-sediment contact (Matthews vein, Tundra Mine; Salmita Mine), or within the volcanics (South zone, Tundra Mine). The majority of gold deposits are found in Cycle Two felsic volcanics usually within 700 m of the volcanic-sediment contact (Ransom and Robb, 1986). Ground magnetic and IP surveys have detected swarms of linear anomalies coincident with zones of disseminated sulphides in the upper felsic volcanic cycle.

In 1976, regional exploration for base metals by Noranda Exploration included reconnaissance and an airborne EM survey of the belt. By the late 1970s, Noranda delineated three polymetallic volcanogenic massive sulphide deposits, the Deb, Ptarmigan and Grizzly. Drill testing of the Deb deposit indicated 1 015 000 t of 0.83% Cu, 2.96% Zn and 21.9 ppm Ag (NMI 75 M/14 Cu3). The deposits are hosted by sulphide accumulations in Cycle One rhyolite lapilli tuff. Geophysical surveys of the area indicate a conductive trend associated with the massive sulphide zone (Ransom and Robb, 1986).

STAR FISH LAKE PROPERTY

Pronto Exploration Ltd.	Gold
1104, 555 Yonge St.	76 D/5
Toronto, Ont., M5E 1J4	64°17'2"N, 111°42'7"W

REFERENCES

Folinsbee (1949).
DIAND assessment report: 082715.

PROPERTY

BARB 1-3 (F14276-F14278).

LOCATION

The claims are at Star Fish Lake 225 km north northeast of Yellowknife.

HISTORY

No prior work has been recorded for the area.

DESCRIPTION

An outlier of Archean volcanics and sediments outcrop at the north end of Star Fish Lake (Fig. 8-78). Bedding and foliation strike northwest to north-northwest and dip steeply southwest. Volcanics and sediments are surrounded and cut by granitic intrusions and all rocks are cross-cut by north-northwest-trending Proterozoic diabase dykes.

CURRENT WORK AND RESULTS

BARB 1-3 were staked in 1987. A 315 line-km VLF EM, EM and magnetometer survey was flown in 1987, orientated 040° with 100 m spacing. A series of VLF EM and EM conductors with coincident magnetic anomalies were defined. Conductors and anomalies were correlated with a linear mafic intrusion. A pronounced VLF EM conductor at the west end of Starfish Lake, not coincident with any other geophysical responses, was thought to relate to a structure controlling the shore line.

JAX LAKE PROJECT

Aber Resources Ltd.	Gold
Highwood Resources Ltd.	76 D/6
700, 1177 W. Hastings St.	64°20'N, 111°24'W
Vancouver, B.C., V6E 2K3	

REFERENCES

Curry (1961); Moore (1956).
DIAND assessment reports: 017118, 016458, 080162, 081495, 082155.

PROPERTY

APA 70 (Lot 001, 88 a); BUMPS LTD. -2; DW , 4, 5, 13-18, 19-33; PRN 9 (Lot 000, 924 a); INK 1-2 (690 ha); NOV 2-3 (1134 ha).

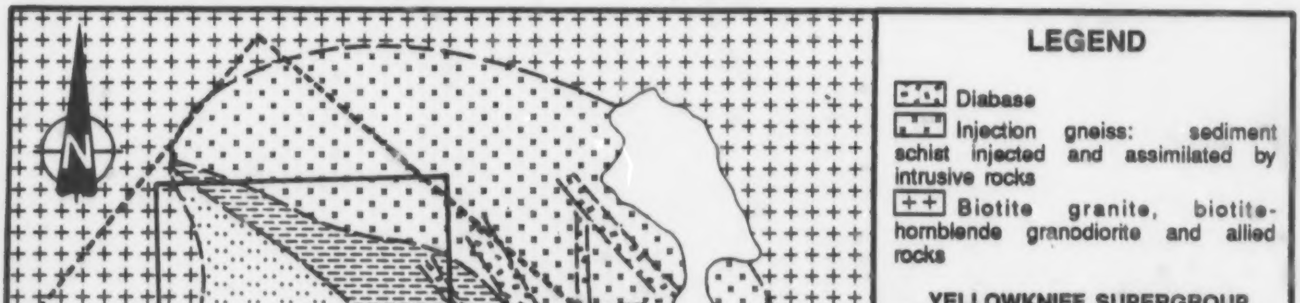
N
LEGEND
Diabase
Injection gneiss: sediment schist injected and assimilated by intrusive rocks
Biotite granite, biotite-hornblende granodiorite and allied rocks
YELLOWKNIFE SUPERGROUP
Nodular quartz-mica schist derived from greywacke, slate and phyllite
Basalt, andesite, dacite, rhyolite, basic intrusive rocks, tuff and agglomerate
BARB 1
BARB 2
BARB 3
SURVEY OUTLINE
Starfish Lake
64°20'
1000
0
1000 m
111°45'

FIGURE 8-78: Geology and claims of the Star Fish Lake area (after Folinsbec, 1949).

LOCATION

The property is centred on Jax Lake, 250 km northeast of Yellowknife (Fig. 8-79).

HISTORY

The area was acquired by Newnorth Gold Mines Ltd. in 1945 and explored in 1959 by trenching and 725 m of diamond drilling. The claims lapsed and the ground was restaked by the Big Four Syndicate in 1959 and 1960 as the FIX and JAX groups. Targets, including the Jax 1 and 2 zones were drilled, and other showings including the Jax 3 and 4 zones were trenched. The JAX and FIX groups were brought to lease, but the lease lapsed and the area was restaked as the DW claims in 1972. The claims were acquired by Savanna Creek Gas and Oil Ltd. and were transferred to Golden Ram Resources Ltd. in 1973. Overburden stripping, trenching and sampling by Golden Ram in 1974 showed gold concentrations in the Jax 1 and Jax 2 zones were less erratic at depth than at surface. Further drill testing of the Jax 1 and Jax 2 zones outlined 36,000 t grading 13.7 ppm gold. The claims were transferred to American Chromium Ltd. (then Perry River Nickel Mines Ltd.) in 1981 who also acquired BUMPS LTD. 1-2, PRN 69 and APA 70. A lease (Lots 1000, 1001) was granted on these properties in 1982. INK 1-2 were staked in 1983 and transferred to American Chromium in 1984. A 150 line-km grid was established over the Jax property during the winter of 1985 as control for magnetometer and VLF EM surveys. Work on American Chromium's leases was done by Highwood Resources and an affiliated company, Aber Resources Ltd., under the terms of an option agreement.

DESCRIPTION

Volcanic rocks west of Jax Lake are conformably overlain to the east by sediments including greywacke, argillite and metamorphosed equivalents. Mafic volcanic rocks predominate and include massive and pillowed flows. A schistose banded unit is formed from recessive-weathering layers of carbonate and felsic tuff. Massive felsic flows and pyroclastic units occupy several stratigraphic levels. An extensive exposure of massive, fine-grained and commonly quartz-feldspar-porphyritic flows, 1 km west of Jax Lake, can be traced the length of the property. Volcanics form a north-trending valley-and-ridge system interrupted by east-trending drift-filled valleys, possibly the surface expression of fault zones. North-trending valleys are underlain by felsic volcanics and ridges are formed by mafic volcanics cut by gabbro intrusions. Gabbro and diorite sills and dykes intrude near contacts between massive mafic flows and the mafic schistose banded unit. The volcanic-sediment contact forms a depression occupied by lakes and swamps. Two north-northwesterly trending Proterozoic diabase dykes intrude all rocks on the property.

CURRENT WORK AND RESULTS

INK 1-2 was transferred to Highwood Resources in 1986. In 1986, the grid was refurbished and extended to the north. A regional magnetometer survey helped define major lithological units. A zone of felsic rocks 1 km west of Jax Lake has a distinctly flat magnetic signature traceable the length of the property and subdivides the mafic volcanics into two cycles. A transition zone of mafic flows, tuffs and minor silicate-facies exhalite overlying the felsic zone exhibits a disjointed magnetic signature. The zone is overlain by Cycle Two mafic flows having a magnetic signature comparable to similar rocks in Cycle One. The best-defined magnetic features on the grid are two north-northwest-trending diabase dykes.

Detailed magnetometer, VLF EM and SP surveys were completed over select areas. Three separate zones, commonly containing multiple, laterally extensive, VLF EM conductors were defined, which are related to silicate-facies iron formation,

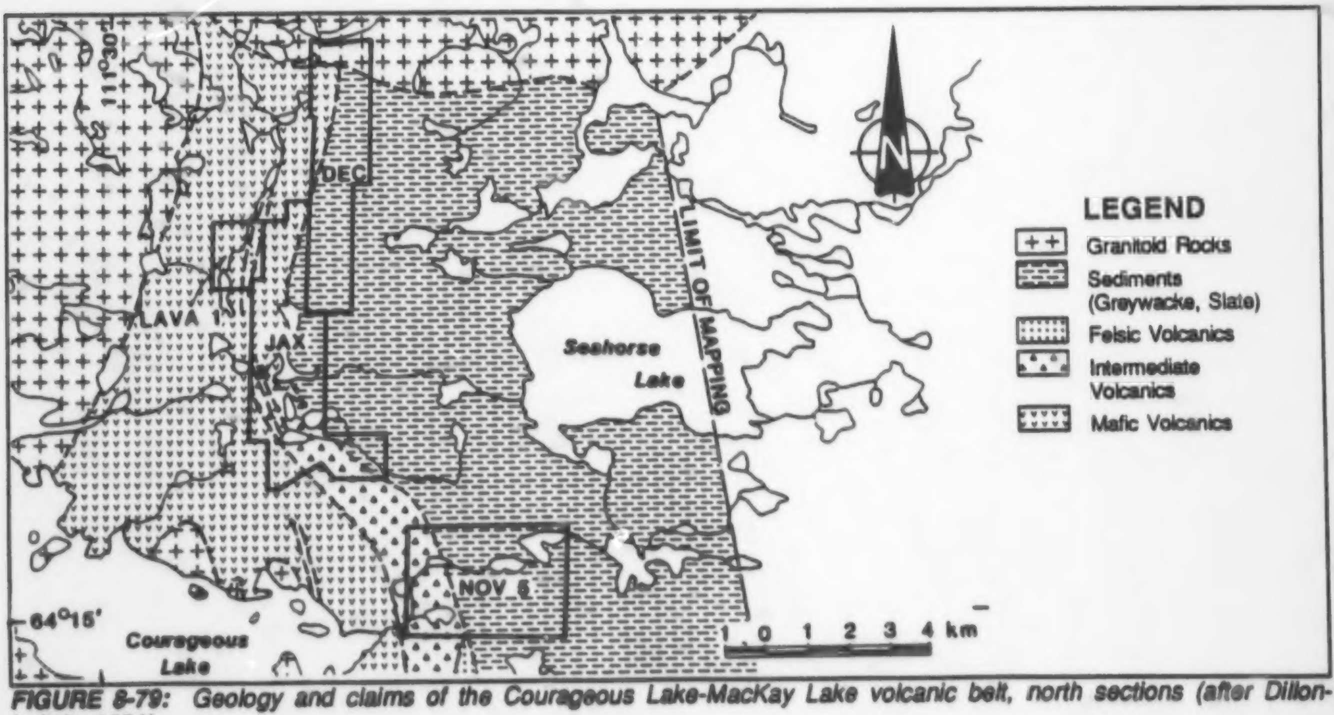

FIGURE 8-79: Geology and claims of the Courageous Lake-MacKay Lake volcanic belt, north sections (after Dillon-Leitch, 1981).

graphite and pyritic felsic tuffs. The transition zone, separating Cycle One and Two rocks is characterized by several linear trends, again related to silicate iron formation and graphite. The third zone defines the contact between volcanic rocks and overlying sediments.

The SP survey was carried out over 8.4 km of the central Jax Lake grid. Several graphite zones were discovered with variable and discontinuous response between lines. A broad feature 20-30 m wide is thought to be gabbro containing magnetite and possible disseminated sulphides. Responses on the eastern portion of the grid are relatively flat with several weak and sporadic anomalous areas.

Reconnaissance geological mapping was done to augment previous 1:4800-scale mapping done by the Big Four Syndicate. The Jax 1 to 4 and Sour Lake showings were evaluated, geophysical anomalies were ground checked and 136 grab samples were collected. Only 12 contained more than 100 ppb Au, and 11 of these were from the five showings.

Both the Jax 1 and 2 zones are at the contact between massive mafic lavas and schistose volcanic rocks. The Jax 2 zone, traced over a 250 m strike length, is two major subparallel quartz veins and associated stringers up to 1.8 m wide. Sulphides, including pyrrhotite, arsenopyrite, pyrite, chalcopyrite and sphalerite, comprise up to 10% of the wallrock and 2% of the quartz veins. Native gold and associated sulphides occupy fractures within the quartz. The Jax 2 zone traced by diamond drilling over a 60 m strike length, displays similar mineralogy to the Jax 1 vein system. The Jax 1 and 2 zones, while not associated with any VLF EM trends, are flanked by two strong formational conductors. The Jax 2 zone displays a weak coincident magnetic association with several weak, positive south-trending anomalies flanking the gold zones. The SP survey over the Jax 2 zone defined a weakly conductive feature extending about 80 m.

The Jax 3 zone, three parallel vein systems, is exposed over a 7.6 m wide interval. The veins are within shear zones cutting massive mafic volcanics. The zone is not associated with a VLF EM anomaly, however, it flanks a major conductor and is close to a major break in the conductor. The SP survey defined several continuous narrow structures flanking a major graphitic zone. This zone runs directly through the Jax 3 trench and may indicate an extension of this zone to the north.

The Jax 4 zone is quartz stringers with minor arsenopyrite and pyrrhotite within schistose volcanic rocks. The zone appears to flank and may be associated with a break in a VLF EM anomaly and is coincident with a strong magnetic anomaly.

LAVA CLAIM

Eugene Luczkiw
c/o Suite 2042, 3080 Yonge St.
Toronto, Ont., M4N 3N1

Gold
76 D/6
64°20'N, 111°25'W

REFERENCES

DIAND assessment reports: 080734, 080908, 081126, 082528.

PROPERTY

LAVA 1 (F10312).

LOCATION

The claim is 250 km northeast of Yellowknife and 8 km north of the north end of Courageous Lake. It is immediately northwest of the area of the old JAX claims (Fig. 8-79).

HISTORY

The history for the area is described under the Jax Lake Project.

DESCRIPTION

The claim is underlain by mafic massive and pillowed flows and agglomerate. Felsic flows, tuffs and agglomerate outcrop along two north to northeast-trending narrow belts in the central and northeast central portion of the claim. Rusty zones within mafic volcanics are interpreted as interflow exhalative units (DIAND assessment report 082528). Zones are commonly siliceous and contain up to 30% combined pyrite and pyrrhotite. Similar rusty zones within felsic volcanics, adjacent to contacts, contain up to 15% combined pyrite and pyrrhotite and may be intraformational exhalites.

The volcanic rocks are cut by a north-trending gabbro dyke in the central portion of the property and along the west central claim boundary. Rock units are north-trending and east dipping. A west-southwest-trending shear zone transects the northeast portion of the claim.

CURRENT WORK AND RESULTS

In 1987 a 35.4 line-km grid with 50 m line spacing was established for control of VLF EM, HLEM and magnetic surveys. Numerous conductors and magnetic anomalies cluster in four broad north-northeast-trending zones. A total of 137 samples were collected from the property. The highest assay of 340 ppb Au was from a sample of felsic tuff with less than 1% pyrite.

DEC 1, 2 CLAIMS

Placer Dome Inc.
P.O. Box 49330,
Bentall Postal Station
Vancouver, B.C., V7X 1P1

Gold
76 D/6
64°21'N, 111°23'W

REFERENCES

Dillon-Leitch (1979, 1981).
DIAND assessment reports: 081907, 082130, 082548.

PROPERTY

DEC 1, 2 (F10314-F10315)

LOCATION

The claims are approximately 255 km northeasterly from Yellowknife and 5 km northwest of Seahorse Lake (Fig. 8-79).

HISTORY

DEC 1 and 2 were staked to cover the volcanic-sediment contact. The claims, recorded in July 1983 for Colray Resources Inc., were optioned to Placer Development Ltd. In 1985 a 23 km grid was established and the area was evaluated by geological mapping, prospecting, "B-C" horizon soil sampling and VLF EM and magnetic surveys. Eight showings of arsenopyrite, spatially associated with the contact, were found. Arsenopyrite is concentrated in the silicified wall rock of apparently barren quartz veins. An exception was found where a quartz vein sample assayed 21.1 ppm Au and wallrock 2.5 and 0.33 ppm Au.

DESCRIPTION

The property is on the eastern margin of the northern end of the Courageous Lake-MacKay Lake volcanic belt. The eastern and southern part of the property is underlain by turbiditic sediments in contact with mafic volcanics to the west, which are intruded by biotite granite in the northern part of the property (Dillon-Leitch, 1981). The andalusite and sillimanite isograd trends west-northwesterly through the southern part of the property and metamorphic grade increases northwards. Basalts enclose layers of stratabound sulphide-facies iron formation (DIAND assessment report 082548). The turbidite-basalt contact is the locus for arsenopyrite bearing auriferous quartz veins.

CURRENT WORK AND RESULTS

In 1986, the grid was expanded to a total of 47 line-km to cover an additional 400 m south of the former grid and line spacing was reduced from 200 m to 100 m. Results from 24 line-km of VLF, magnetometer and geochemical surveys, prospecting and mapping were integrated with the results from the corresponding 1985 surveys. In addition, a 37.1 line-km IP survey was completed. A series of strong conductors were detected within the basalts, close to the contact, that were related to bands of sulphide-facies iron formation. Weaker conductors coincide with the volcanic-sediment contact and are in the sediments. Four main arsenopyrite-gold showings were identified. The zones comprise apparently barren quartz veins with arsenopyrite enriched wallrock and are controlled by a flexure in volcanic-sediment contact.

Thirty drill holes totalling 4167.7 m were completed in 1987. Seventeen holes, totalling 1666.4 m tested Zone I: the downdip projection of quartz-arsenopyrite stockworks; chargeability anomalies thought to indicate the lateral extension of Zone I; the volcanic-sediment contact; and a geophysical anomaly in volcanics to the west of the contact. The chargeability anomalies were attributed to pyritic schist with arsenopyrite laminae that was intersected in five drill holes. The best assay for Zone I was 1.51 ppm Au from a 0.5 m intersection of quartz with disseminated arsenopyrite. Zone II was probed by nine holes totalling 1868.7 m. The holes were designed to test both Zone II and the possible downdip extension of Zone I as well as a chargeability anomaly. Two drill holes intersected quartz veins, lenses and stringers including disseminations of arsenopyrite in schistose wallrock. Visible gold was noted in the core and the best assay of 23.2 ppm Au came from a 1 m intersection of a quartz vein with fracture controlled pyrite. A single 96.0 m drill hole probed Zone III and tested an associated chargeability anomaly. The Lake zone was evaluated by three drill holes totalling 536.6 m. A 0.5 m intersection of quartz with disseminated arsenopyrite in the wallrock assayed 5.2 ppm Au. Layers of sulphide-facies iron formation are enclosed by basalts of the Lake zone. A 0.5 m intersection of iron formation assayed 1.08 ppm Au.

NOV 5 CLAIM

Courageous Exploration Inc. Gold
Suite 810, 540 5th Ave. SW 76 D/3
Calgary, Alta., T2P 0M2 64°13'N, 111°18'W

REFERENCES

McGlynn (1971), Moore (1956).
DIAND assessment reports: 017116, 082543.

PROPERTY

NOV 5 (F13168).

LOCATION

The NOV 5 claim is at the eastern tip of the northernmost shoreline of Courageous Lake (Fig. 8-79).

HISTORY

The ALPHA claims, held by the Big Four Syndicate covered the area in the late 1950s. In 1959, claims were mapped by G.W. McConnell (DIAND assessment report 017116). Auriferous quartz veins and stringers were discovered in sheared felsic volcanics. The report states that "a considerable amount of stripping and trenching was done by former owners on a number of zones on the property". But no record of this work was found. The claims cover the Kennedy showing, described by Moore (1956) and McGlynn (1971).

DESCRIPTION

The claim covers metamorphosed siltstone with lesser quartzite, phyllite and slate. A single outcrop of lithic tuff was mapped near the western boundary of the property. The Kennedy showing, 3.2 km east of the northeast bay of Courageous Lake at the northeast corner of the claim, is grey glassy quartz veins and is exposed in six trenches. Veins are lenticular, 5 to 30 cm wide and less than 10 m long. They contain galena, pyrite, arsenopyrite (DIAND assessment report 082543) chalcopyrite and ankerite (Moore, 1956). Gold is visible along cross fractures in the veins (Moore, 1956).

CURRENT WORK AND RESULTS

The NOV 5 claim was recorded January 6, 1986. Six days were spent in August, 1987 to establish a 10 km grid and complete magnetometer, VLF, soil and geological surveys of the grid area including the Kennedy showing. Four weak to moderate strength VLF conductors were detected, parallel to strike. Two hundred and twenty three soil samples were collected at 5 m intervals along grid lines. The sample interval was reduced to 2 m at VLF crossovers. Samples were analyzed for gold, arsenic and copper. None were anomalous. Ten grab samples collected from the Kennedy showing assayed up to 46.6 ppm Au.

LEAN CLAIMS

Noranda Exploration Company Ltd. Gold
4 - 2130 Notre Dame Ave. 76 D/3
Winnipeg, Man., R3H 0K1 64°12'N, 111°12'W

REFERENCES

Moore (1956); Seaton (1983a,b, 1984).
DIAND assessment reports: 080988, 082414.

PROPERTY

LEAN 1-6 (A97764-69)
LEAN 7 (A97601)
LEAN 9-11 (A97611-97609).

LOCATION

The property is 240 km northeast of Yellowknife, approximately 2 km east of the north arm of Courageous Lake (Fig. 8-80).

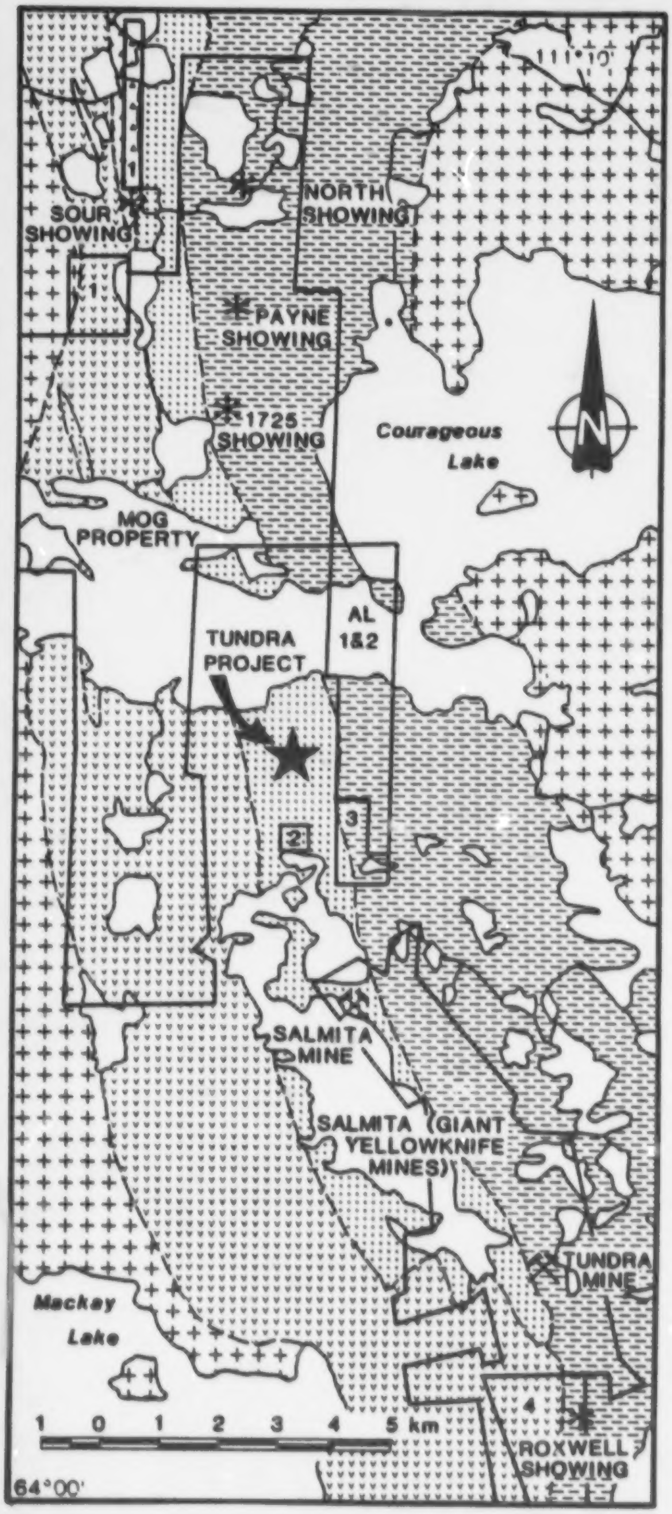
111°10'
SOUR SHOWING
NORTH SHOWING
PAYNE SHOWING
1725 SHOWING
Courageous Lake
N
MOG PROPERTY
AL 1&2
TUNDRA PROJECT
1
2
3
4
SALMITA MINE
SALMITA (GIANT YELLOWKNIFE MINES)
TUNDRA MINE
Mackay Lake
ROXWELL SHOWING
1 0 1 2 3 4 5 km
64°00'

FIGURE 8-80: Geology and claims of the Courageous Lake-MacKay Lake volcanic belt, central section (after Dillon-Leitch, 1981).

LEGEND
⊞ Granitoid Rocks
▤ Sediments (Greywacke, Slate)
▒ Felsic Volcanics
▩ Intermediate Volcanics
▦ Mafic Volcanics
* Showing/Deposit
⚒ Former Mine
Claim Groups/Project Areas
1 LEAN
2 RED 24
3 SVELT
4 BS & COUR

HISTORY

The LEAN claims were staked in 1978 to cover an airborne conductor parallel to the volcanic-sediment contact, detected during Noranda's 1976 survey. In the same year, grids were established and EM, gravity and magnetic surveys delineated two zones of high conductivity and a third zone of poorly defined conductors. A single diamond-drill hole totalling 59.5 m tested a moderate EM conductor with a gravity expression. The hole intersected graphitic tuff breccias with up to 10% pyrite stringers, but no core was assayed. The LEAN claims were optioned to Getty Resources in 1981.

DESCRIPTION

The geology of the LEAN group is described by Fraser (DIAND assessment report 080988) as a complex area of thinly alternating layers of mafic, felsic and intermediate volcanics and sediments on the flank of the Courageous Lake-MacKay Lake volcanic belt.

CURRENT WORK AND RESULTS

During 1987, a perimeter survey was completed on the LEAN claims to bring the claims to lease. A 6.7 line-km grid was chained and picketed. A 5.6 line-km VLF EM survey was completed to extend 1978 coverage. Three parallel north-northeast-trending conductive zones were detected approximately parallel to, but not coincident with, the trend of anomalies delineated by the 1976 survey.

MOG Property

Mill City Gold Corp./
Gunnar Gold Inc.
850, 11012 MacLeod Trail SE
Calgary, Alta., T2J 6A5

Gold
76 D/3
64°10'N, 111°19'W

REFERENCES

Lord (1951); Moore (1956); Dillon-Leitch (1981).

DIAND assessment reports: 061295, 080987, 081832, 082464, 082303, 082615.

PROPERTY

MOG 1-4 (F10287-90)
BULL 3 (F11583)
BULL 4 (F10334)
ML 3132 (BLAKE 25-32).

LOCATION

The claims are 250 km northeast of Yellowknife and straddle the central narrow reaches of Courageous Lake (Fig. 8-80).

HISTORY

In 1945 the MINT group was staked to cover auriferous quartz stringers on ground now covered by MOG 1-4. The claims were acquired in 1946 by Payne Yellowknife Gold Mines Ltd. and stripping, trenching and 247 m of diamond drilling in eight holes tested the showings (DIAND assessment report 082464; NMI 76 D/3 Au4). The claims lapsed after 1953.

The BLAKE claims, immediately west of the area now covered by the MOG claims, were staked in 1973 and explored in 1976 by means of VLF EM and geochemical surveys. Weak to moderate VLF EM conductors trending sub-parallel to the volcanic-sediment contact and three arsenic anomalies in soils were detected.

In 1976, Noranda Exploration flew an EM survey over the area which detected several conductors immediately south of Courageous Lake that were subsequently staked as the THIN claims. In 1977, a grid was established and VLF, VLEM, HLEM, magnetic, gravity and geological surveys were completed. A combined EM and magnetic anomaly with a weak gravity expression was tested by a single drill hole of 61.5 m. The hole cut mafic to intermediate volcanics and tuffs with pyrite-pyrrhotite stringers. Narrow intersections of up to 0.046% Cu and 0.031% Zn were recovered (DIAND assessment report 080987). The claims lapsed.

MOG 1-4 and BULL 3 and 4 were registered by H. Mogenson in 1983. In 1984, Cominco optioned the MOG claims and carried out geological mapping, VLF EM and magnetic surveys and geochemical sampling. In the following year, the BULL claims were optioned by Cominco, existing grids were extended and IP, VLF EM and magnetic surveys were completed on both claim groups (DIAND assessment reports: 081832, 081953). Two showings were examined and a third was discovered. Four drill holes, to test an IP anomaly under Courageous Lake, intersected barren pyritic tuff.

DESCRIPTION

The property is underlain by massive and pillowed basalt flows and amygdaloidal andesite that flank a granodiorite batholith immediately west of the claims. A thin unit of rhyolite block breccia (possibly Cycle One) enclosed by mafic volcanics, trends north-northwest in the eastern portion of the property. Mafic volcanics are overlain by rhyolite flows (Cycle Two). MOG 1 and 4 cover greywacke, slate and arkose turbidites that overlie the volcanic assemblage (Dillon-Leitch, 1981).

CURRENT WORK AND RESULTS

Four drill holes totalling 676 m on the MOG claims and six holes totalling 562 m on the adjacent BLAKE claims were completed on the ice of Courageous Lake. All holes intersected calcareous felsic lapilli tuff with up to 10% very fine-grained disseminated pyrite and pyrrhotite. The unit is thought to be the northern extension of the Carbonate zone of the Tundra project, described in this chapter.

The MOG claims were transferred back to H. Mogenson in August, 1986 and were optioned by Mill City Gold Corp. (50%) and Gunnar Gold Inc. (50%) in the summer of 1987. MPH Consulting Ltd, was contracted to survey a 300 km grid; 258 km of magnetic surveys and 243 km of VLF EM surveys at 100 m line spacing with 43 km of IP/resistivity surveys at 200 m line spacing were completed. The reconnaissance IP surveys covered much of the area from the south shore of Courageous Lake to the north end of the claim group. No distinct magnetic anomalies were found on the north claims. Magnetic highs on the south claims were related to synvolcanic mafic intrusions or diabase dykes. Combined results of the VLF EM and IP survey indicate two linear trends on the north claims. The first trend corresponds to graphitic argillite layers within sediments and the second trend is related to zones of shearing or faulting.

The Payne showing, a quartz vein zone in chlorite schist is exposed in a trench. Samples from the trench, bearing pyrite and arsenopyrite, assayed up to 1.3 ppm Au. The 1725 showing and a newly discovered showing of dark grey quartz veins in sericite chlorite schist were examined and sampled.

Based on the geophysical results, 3000 m was planned. However, drilling was abandoned due to weather conditions after the completion of one 168.25 m hole. The hole targeted a broad IP anomaly on strike with the Tundra Project Main zone and intersected isoclinally folded argillite and greywacke with interlayered felsic volcaniclastics.

AL CLAIMS

Courageous Exploration Inc.
Suite 810, 540 5th Ave. SW
Calgary, Alta., T2P 0M2

Gold
76 D/3
64°07'N, 111°15'W

REFERENCES

DIAND assessment report: 082636.

PROPERTY

AL 1-2 (F10291-F10292).

LOCATION

The property is 240 km northeast of Yellowknife and 4 km north of the Salmita Mine. The claims border BERTHA 1 and 2 of Noranda's Tundra Project (Fig. 8-80).

HISTORY

The exploration history for the area is summarized under the description for the Tundra Project. AL 1 and 2 were staked in 1983 by Lorne McNeice and transferred to American Chromium in 1984.

DESCRIPTION

The claim covers greywackes, slates and phyllites of the Yellowknife Supergroup. Felsic tuff to lapilli tuff outcrop in the southwest corner of AL 1. Rocks strike 355° and dip subvertically. They are cut by east-trending gabbro dykes.

CURRENT WORK AND RESULTS

The claims were acquired by Courageous Exploration Inc. in April, 1987. Between August 15-23, the property was explored by magnetometer, VLF EM, geochemical and geological surveys. A 14 km square grid was established over the southern end of AL 1 for control of VLF EM and magnetometer surveys. A linear weak to moderate strength conductor strikes 350° and dips to the east. Two hundred and forty-three soil samples were collected from frost boils and analyzed for gold, arsenic and copper. There is no clearly defined distribution of anomalous soils.

SVELT 2 CLAIM

Noranda Exploration Co. Ltd.	Gold
4 - 2130 Notre Dame Ave.	76 D/3
Winnipeg, Man., R3H OK1	64°06'N, 111°15'W

REFERENCES

Moore (1956); Seaton (1983a, 1983b, 1984).
DIAND assessment report: 082521.

PROPERTY

SVELT 2 (F10671).

LOCATION

The claim is at Matthews Lake, 235 km northeast of Yellowknife (Fig. 8-80).

HISTORY

SVELT 2 was staked in 1983. No previous work has been recorded for the immediate area. A history of exploration for the adjacent area is described under the Tundra Project.

DESCRIPTION

There is less than 5% outcrop on the property. Frostheave blocks and talus piles are greywacke, arkose and slates of the Yellowknife Supergroup. Sediments are strongly foliated and steeply dipping. An assumed north-westerly striking fault, occupied by a topographic low, displaces the east-trending gabbro dyke cutting the northwest corner of the claim. Adjacent outcrop exposures are brecciated with quartz carbonate filled fractures (DIAND assessment report 082521).

CURRENT WORK AND RESULTS

A day was spent in 1987 for reconnaissance of the claim. Nine grab samples were taken for geochemical analysis. Samples assayed up to 40 ppb Au.

TUNDRA PROJECT (FAT DEPOSIT)

Noranda Exploration Co. Ltd.	Gold
4 - 2130 Notre Dame	76 D/3
Winnipeg, Man., R3H 0K1	64°06.7'N, 111°16.3'W

REFERENCES

Comeau *et al.* (1987); Comeau (1990); Seaton and Crux (1985); Seaton *et al.* (1987).
DIAND assessment reports: 017117, 080907, 081689, 081894, 081900.

PROPERTY

FAT and BERTHA leases.

LOCATION

The property is approximately 200 km northeast of Yellowknife, between Matthews Lake and Courageous Lake and about 4 km north-northwest of the Salmita Mine (Fig. 8-80).

HISTORY

The area of the Fat deposit was held in 1946 as the NASH, KB and TPR claims (Seaton and Crux, 1985). The first recorded work was in 1964 when Giant Yellowknife Mines staked the RED group of 23 claims over the area north of Matthews Lake. At the time it was noted that several small pits and trenches and a few small diamond drill holes were found on the RED claims (DIAND assessment report 017117). The claims were explored in 1965 by magnetometer and EM surveys. Conductors were tested by four holes totalling 663 m (DIAND assessment report 017117; NMI 76 D/3 Au1). RED 24 was acquired by Giant Yellowknife Mines in 1973 and is described in Chapter 2. RED 1-23 lapsed by 1975.

In 1976 Noranda began reconnaissance of the Courageous Lake-MacKay Lake volcanic belt, followed by a combined airborne EM and magnetic survey of the area, to evaluate the base metals potential of the region. The FAT claims were staked for Noranda in the spring of 1977 to protect geophysical anomalies north of Matthews Lake. Grids were established over AEM responses south of Courageous Lake (Fat IV Grid) and southeast of the mouth of Matthews Creek (Fat II Grid). CEM, VLEM, magnetic and geological surveys were completed on both grids, and a gravity survey was completed on the grid near Courageous Lake. A number of conductive zones were outlined that were attributed to pyrrhotite. A sample of pyrite and pyrrhotite bearing felsic tuff collected from the Fat IV grid assayed 18.9 ppm Au (DIAND assessment report 080907).

In 1979 Getty Canadian Metals (49%) and Noranda Exploration (51%) formed a joint venture to continue exploration of the belt. By 1981 exploration emphasis shifted from base metals to gold. FAT 63-67 had lapsed and BERTHA 1 was staked to cover the area. The Fat IV grid was restored to control geological and magnetic surveys. A succession of felsic lapilli and crystal tuff and agglomerate with local disseminations of arsenopyrite, pyrite and pyrrhotite were mapped. The highest assay reported from the nineteen samples collected was 59.0 ppm Au.

In 1982 magnetic and IP surveys were completed over the grid and two holes totalling 290 m were drilled from a single collar to probe part of what is now known as the Main zone. Intersections of arsenopyrite bearing tuff yielded up to 8.0 ppm Au over 4 m (DIAND assessment report 081689). In 1983 total field and vertical gradient magnetic surveys were completed over the grid. The area was prospected and 14 samples were collected. Half the samples contained more than 500 ppb Au and four samples assayed more than 1 ppm Au. Nine holes totalling 1090 m were drilled (Seaton and Crux, 1985) to test a 450 m strike length of the Main zone. All holes intersected auriferous zones (DIAND assessment report 081900).

In the spring and fall of 1984, 36 drill holes totalling 6,243 m tested the Main zone and other exploration targets including the Carbonate zone (Seaton *et al.*, 1987). A total field magnetometer survey was conducted in the spring (DIAND assessment report 081894). BERTHA 1 and adjoining portions of the FAT claims were converted to mining leases in July 1984. Exploration during the summer consisted of regridding, remapping, sampling, trenching, outcrop stripping and IP and HLEM surveys (Seaton *et al.*, 1987).

During 1985 the Fat IV grid was extended south to include a portion of Matthews Lake. Magnetic and VLF EM surveys were completed over the grid. The magnetic survey defined units of mafic and felsic volcanics and northerly trending diabase dykes. Local magnetic features were attributed to pyrrhotite concentrations, mafic rocks, and in one instance, an alteration zone in felsic volcanics. Several VLF conductors were outlined, some coincident with magnetic highs (Seaton *et al.*, 1987). Late in the year, three deep holes were drilled to a vertical depth of 490 m to test the downdip continuity of the auriferous zones. The best intersection of 19.2 ppm Au over 6.1 m true width was recovered from -365 m (Getty press release, June 24, 1987). At the completion of work in 1985, probable resources for the Main zone along a strike length of 1.2 km and to a vertical depth of 120 m were estimated to be 1 160 000 t averaging 9.6 ppm Au and estimates for the Carbonate zone were 900 000 t averaging 12 ppm Au (NMI 76 D/3 Au7).

DESCRIPTION

The following is summarized from Comeau *et al.* (1987, 1990):

The Main and Carbonate zones are in a sequence of rhyodacitic to rhyolitic pyroclastics and volcaniclastics (Fig. 8-81), divided into a lower and upper cycle. The lower cycle comprises rhyodacitic flows up to 400 m thick, overlain by 45 to 150 m of calcareous sediments, the Carbonate zone, with abundant interlayers of rhyodacitic lapilli in a calcareous matrix. A narrow layer of locally graphitic pelitic sediments is found at the top of the lower cycle. The base of the upper cycle of volcanics is 180 to 300 m of rhyodacitic lapilli tuff to agglomerate overlain by felsic volcaniclastics transitional to Yellowknife Supergroup sediments.

The Main zone, multiple auriferous vertically dipping shear zones, subparallel to strata, varies from 100 to 250 m wide. The zone was traced for a strike length of more than 1.5 km and is open at depth. Shear zones exhibit a characteristic alteration assemblage of arsenopyrite, sericite and silicification. Chalcopyrite, sphalerite and scheelite have been identified within the zones but are rare. Within the shear zones sericite locally, or totally, replaces the host rock and arsenopyrite forms dense felted masses within sericitized rock, or disseminations of acicular crystals. Silicification is characterized by blue-grey quartz veins and infusions. Gold fills fractures within sulphides, particularly arsenopyrite. Native gold is rare and restricted to quartz veins.

Magnetic and IP surveys were used extensively to define drill targets. The deposit has a characteristic magnetic signature and can be outlined by IP responses.

CURRENT WORK AND RESULTS

In late 1986 five holes totalling 3050 m tested the downdip continuity of the Main zone. Multiple ore-grade intersections (Table 8-9) were recovered to a vertical depth of 500 m (Getty 1987 Annual Report). In 1987, more than 36 000 m of drilling probed a 1.5 km strike length of the Main zone (Northern Miner 87/07/06; Getty Press Release, November 1987; Getty December 1987 Interim Report).

TABLE 8-9: 'NOTEWORTHY' INTERSECTIONS, 1986 DRILLING

	From (m)	to (m)	Cored Interval (m)	g/t Au
F-40	342.9	346.9	4.0	11.0
		Includes	2.5	14.4
	442.5	448.5	6.0	9.3
F-41	240	253.2	13.2	11.0
		Includes	5.5	18.9
	345	348	3.0	8.9
	391.5	404.4	12.9	8.9
		Includes	4.9	12.3
	445.3	448.8	3.5	11.3
	473.3	481.3	8.0	14.4
		Includes	5.5	17.8
	508.9	515.4	6.5	5.8
F-42	174.5	184	9.5	7.8
		Includes	3.5	9.9
F-43	158.0	166.0	9.0	6.8
	178.0	185.0	7.0	7.8
		Includes	2.0	13.7
	203.5	215.2	11.7	8.2
		Includes	3.5	14.7
F-44	132.0	137.0	5.0	6.5
	272.0	273.5	1.5	16.5
	296.0	299.0	3.0	7.5

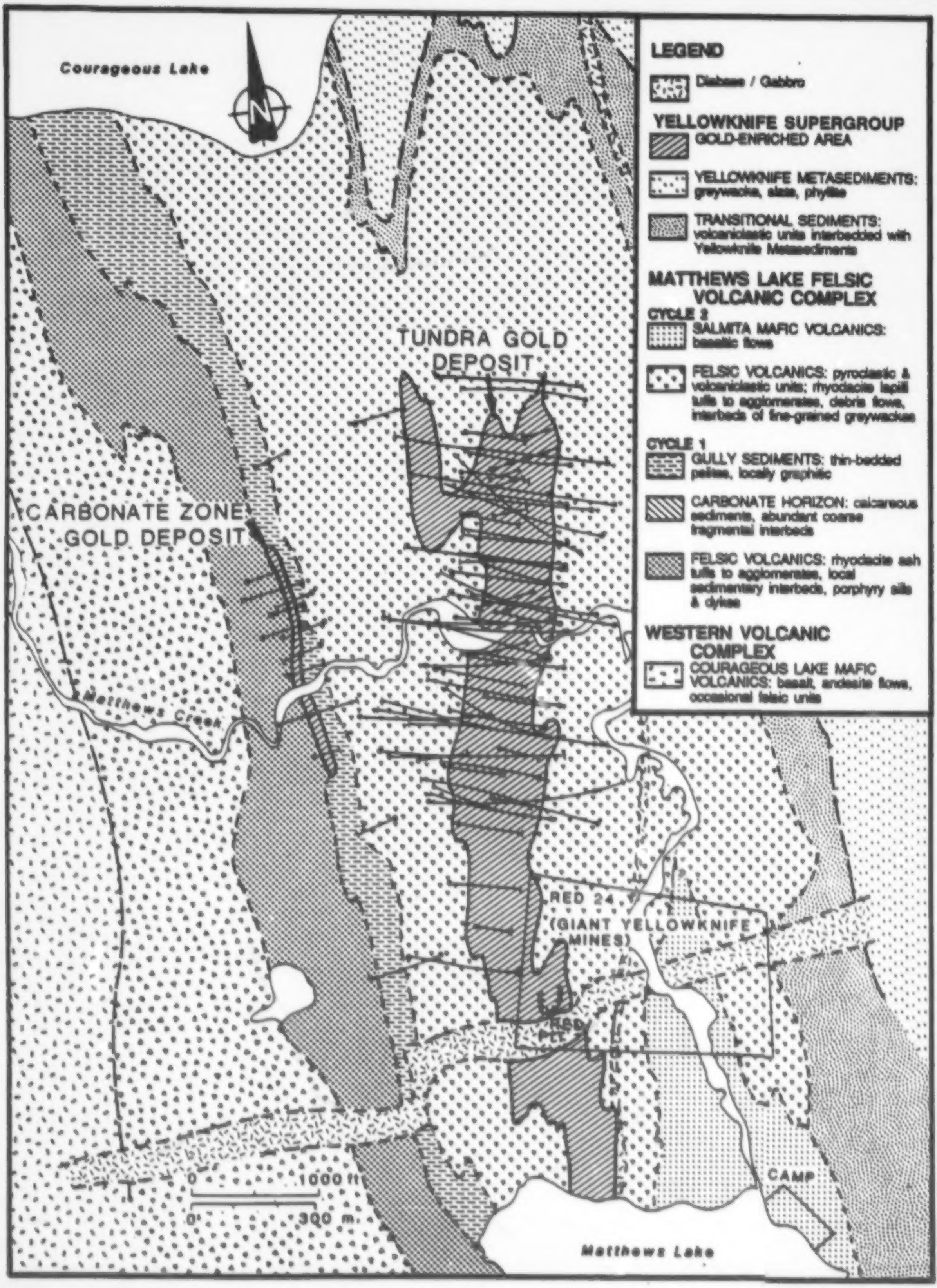
Courageous Lake
N
TUNDRA GOLD DEPOSIT
CARBONATE ZONE GOLD DEPOSIT
Matthews Creek
RED 24
(GIANT YELLOWKNIFE MINES)
Red Pit
CAMP
Matthews Lake
0 1000 ft
0 300 m.
LEGEND
Diabase / Gabbro
YELLOWKNIFE SUPERGROUP
GOLD-ENRICHED AREA
YELLOWKNIFE METASEDIMENTS: greywacke, slate, phyllite
TRANSITIONAL SEDIMENTS: volcaniclastic units interbedded with Yellowknife Metasediments
MATTHEWS LAKE FELSIC VOLCANIC COMPLEX
CYCLE 2
SALMITA MAFIC VOLCANICS: basaltic flows
FELSIC VOLCANICS: pyroclastic & volcaniclastic units; rhyodacite lapilli tuffs to agglomerates, debris flows, interbeds of fine-grained greywackes
CYCLE 1
GULLY SEDIMENTS: thin-bedded pelites, locally graphitic
CARBONATE HORIZON: calcareous sediments, abundant coarse fragmental interbeds
FELSIC VOLCANICS: rhyodacite ash tuffs to agglomerates, local sedimentary interbeds, porphyry sills & dykes
WESTERN VOLCANIC COMPLEX
COURAGEOUS LAKE MAFIC VOLCANICS: basalt, andesite flows, occasional felsic units

FIGURE 8-81: Geology and drill hole plan of the Tundra gold deposit (after Comeau, 1987 and 1990)

Metallurgical tests utilizing oxygen pressure leach and roasting were preformed by Lakefield Research (Canadian Mining Journal, September 1987) and Sherritt Gordon Mines (NMI 87/09/21) on composite samples (Comeau *et al.*, 1987) to determine the most efficient extraction method. The bioleaching method (as described for RED 24) was also considered. Tests showed that the ore is refractory and gold is confined mainly to arsenopyrite, and to a lesser extent, pyrite and pyrrhotite. Approximately 3% of the gold is free milling. Direct cyanidation can recover 25 to 30% of the gold and a standard flotation circuit can recover 90% of the gold. Up to 98% of the gold is recoverable if the sulphides minerals are decomposed by pressure oxidation techniques. Drill core from shallow holes was tested by Lakefield Research utilizing oxygen pressure leach and roasting. Gold recovery rates of 93% were achieved (Canadian Mining Journal, September 1987).

In September 1987, the joint venture partners announced plans for underground exploration that included sinking a vertical exploration shaft to the -450 level, drifting, underground drilling, raising to collect a bulk sample and metallurgical testing (NMI 87/09/21, Getty Resources Ltd. Interim Report December 1987).

At the end of 1987, the estimated undiluted geological reserves (excluding results from the final eight holes completed in 1987) were: 24 Mt at 6.2 ppm Au using a cutoff of 3.4 ppm Au; 8.4 Mt of 8.9 ppm Au using a cutoff of 6.8 ppm; or 1.9 Mt of 13.4 ppm Au using a cutoff of 10.3 ppm Au.

BS AND COUR CLAIMS

Bow Valley Industries	Gold
2020 - 1177 W. Hastings St.	76 D/3
Vancouver, B.C., V6E 2K3	64°00'30"N, 111°30"W

REFERENCES

Seaton (1984).
DIAND assessment reports: 082387, 082456, 082546.

PROPERTY

BS 1 (F04324)
BS 2 (F09123)
COUR 1 (F05778).

LOCATION

The property is 235 km northeast of Yellowknife and 7.5 and south of the Salmita Mine (Fig. 8-80).

HISTORY

In 1945, the Tundra, Salmita and BS showings were staked as the JEJA and ROMA claims. In 1950, Homer Yellowknife Gold Mines optioned the claims and drilled eight holes totalling 614.3 m to test the Perrson vein (DIAND assessment report 082387). The claims lapsed and were restaked by Goldcrest Mines Ltd. in 1958 as the DON claims. The DON claims were explored by trenching, mapping and 2347 m of diamond drilling in 36 holes to test two zones on the Perrson vein and the Saucer Lake showing (DIAND assessment report 082456). Reserves of the Perrson vein and the Saucer Lake showing are estimated by Roxwell Gold Mines (1983 Prospectus) to be 125 600 t proven and 190 500 t probable at a weighted grade average of between 4.5 ppm to 5.1 ppm Au. The claims lapsed in 1970 and were restaked as the TK claims. The TK claims were optioned in 1973 by Golden Ram and explored by VLF EM surveys and trench sampling. The option expired and the claims were optioned again in 1974 by Perry River Nickel Mines and evaluated by geochemical and geophysical surveys.

In 1978 claims of the TK group lapsed. BS 1 and 2 were staked and acquired by Roxwell Gold Mines. Geochemical and VLF EM surveys were completed over a grid established on BS 2. Ten diamond-drill holes totalling 515 m tested various targets (Seaton, 1984).

In 1983, Giant Yellowknife Mines optioned BS 1 from Roxwell Gold Mines and explored with IP, resistivity and magnetic surveys and one drill hole totalling 151 m. The hole intersected a zone 8.7 m in true width containing 6.7 ppm Au (Seaton *et al.*, 1987). Geological and geophysical survey areas were extended in the following year, the 1983 drill hole was deepened by 58.73 m and six new holes totalling 1175 m were completed. COUR 1 was staked in the same year. Giant, in a joint venture with Cominco, completed three drill holes totalling 647 m in 1985, before the option was terminated.

DESCRIPTION

Mafic flows and tuffs grade upward into mixed mafic and felsic tuffs and then to felsic tuffs. The volcanic assemblage is in contact with well bedded slates, phyllites, argillites and arkosic to quartzose greywacke with minor interbeds of felsic tuff. The Saucer Lake showing comprises abundant quartz stringers in cross-cutting and conformable relationship with enclosing mafic and felsic tuffs. Sulphides, typically pyrite and arsenopyrite, form clots and crystals in both the hanging wall and footwall. The Saucer Lake showing is continuous with the Perrson vein, 425 m to the north. The Perrson vein is enclosed by felsic tuffs near the mafic contact. The vein ranges from 2.15 to 8.6 m in true width.

CURRENT WORK AND RESULTS

In the summer of 1987, two diamond drill holes totalling 424.9 m, probed the Perrson vein. Both holes cut sequences of mixed mafic and felsic tuffs, felsic tuffs and sediments. A 3.1 m intersection of 4.3 ppm Au was recovered from one hole and an intersection of 1.3 m of 2.1 ppm Au from the other.

INKA AND BERTHA CLAIMS

Noranda Exploration Co. Ltd.	Base Metals
4 - 2130 Notre Dame Ave.	75 M/14
Winnipeg, Man., R3H 0K1	63°55'N, 111°10'W

REFERENCES

DIAND assessment reports: 081445, 082418, 082777.

PROPERTY

INKA 1 (F08956)
INKA 2 (F01215)
BERTHA 5 (F08955).

LOCATION

The claims are at the Nodinka Narrows on MacKay Lake, about 225 km northeast of Yellowknife (Fig. 8-82).

HISTORY

INKA 2 was formerly held by Noranda as HARE 1. HARE 2-6 were explored in the summer of 1980 by VLEM, HLEM, VLF EM, magnetic and geological surveys. HARE 1 was on strike with a north-northwest-striking conductor and coincident magnetic anomaly, detected at the north end of HARE 2 on the south shoreline of Nodinka Narrows. Four holes totalling 85.2 m were drilled on HARE 2-6 to test geophysical targets. HARE 1 lapsed in June 1982 (DIAND assessment report 081445). INKA 1 and 2 and BERTHA 5 were staked by Noranda Exploration Co. Ltd. in the summer and autumn of 1983 to cover the possible on strike extension of EM and magnetic anomalies detected during Noranda's 1976 airborne survey of the belt.

DESCRIPTION

The INKA claims cover the Nodinka Narrows and exposure is limited to the tip of a peninsula in the southeast corner of INKA 1. BERTHA 5 covers north-northwest-striking, steeply dipping mafic flows and tuffs overlain by dacite and rhyolite tuffs. The volcanic assemblage is in contact with argillites, greywackes and arkoses of the Yellowknife Supergroup (DIAND assessment report 082777).

CURRENT WORK AND RESULTS

An 88.05 km grid was established during the winter of 1987 and 82.35 km of VLF EM and magnetometer surveys were completed. VLF EM readings were taken every 25 m and magnetometer readings every 12.5 m spacings. Three strong conductive zones coincident with magnetic and airborne anomalies were identified.

NOD Claims

Consolidated Parklane Resources Inc.	Gold
Box 10	75 M/14
1000 - 609 W. Hastings St.	65°53'N, 111°05'W
Vancouver, B.C., V6B 4W4	

REFERENCES

Folinsbee (1949); Henderson (1944); Moore (1956).
DIAND assessment reports: 081826, 082240.

PROPERTY

NOD 1-4 (F11641-F11645).

LOCATION

The property is on a peninsula on the south shore of MacKay Lake at Nodinka Narrows, 230 km northeast of Yellowknife and 17 km south of the Salmita Mine (Fig. 8-82).

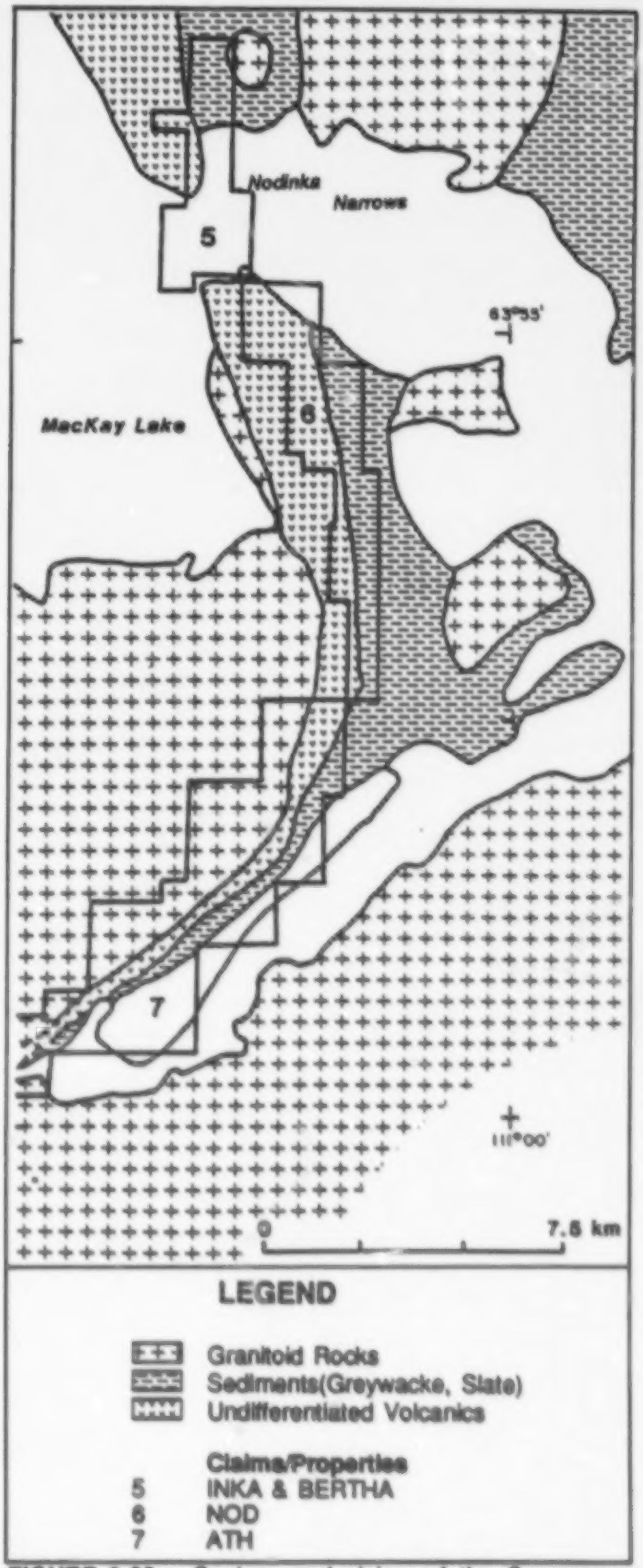

FIGURE 8-82: Geology and claims of the Courageous Lake-MacKay Lake volcanic belt, south section (after Dillon-Leitch, 1981 and Henderson, 1944).

HISTORY

The claims were staked in 1983. Highwood Resources Ltd. acquired the property the same year and conducted reconnaissance geological mapping, sampling and VLF EM surveys. In 1984, Cominco optioned the claims and carried out additional geological mapping, sampling and a reconnaissance IP survey (DIAND assessment report 081826). A coincident high-chargeability and low-resistivity anomaly was detected on the southernmost of the IP survey lines on NOD 2 and two rock geochemical anomalies were found on NOD 3. The claims were returned to Highwood in 1985.

DESCRIPTION

The property covers the contact between sediments to the east and underlying volcanics of the Courageous Lake-MacKay Lake volcanic belt to the west (Folinsbee, 1949; Henderson, 1944; Moore, 1956). Volcanics are predominantly mafic. A narrow unit of felsic volcanics at the volcanic-sediment contact is coincident with an IP anomaly and a rock geochemical anomaly (90 ppb Au obtained by Cominco). Immediately west of the felsic unit is a thicker interval of mixed mafic and felsic volcanics. A granitic batholith is west of the claims and smaller granitic plugs intrude the supracrustals on NOD 3 and NOD 4.

CURRENT WORK

The claims were transferred to Parklane Technologies Inc. in October, 1986. In February 1987, a 6.3 line-km grid was established over the sediment-volcanic contact for control of total-field magnetometer, vertical-gradient magnetometer and VLF EM surveys. The geophysical surveys identified a magnetic and conductive anomaly coincident with the IP anomaly detected by Cominco. Several magnetic anomalies, not associated with conductors, were attributed to diabase dykes.

ATH CLAIMS

Roxwell Gold Mines Ltd.	Gold
P.O. Box 190	75 M/11,12,14
Lions Bay, B.C. VON 2E0	63°42'N, 111°34'W

REFERENCES

Henderson (1944).
DIAND assessment reports: 082537, 082538.

PROPERTY

ATH 1 (F12706)
ATH 4 (F12709)
ATH 6-8 (F12711-F12713)
ATH 16-18 (F12721-F12723)
ATH 19-21 (F14377-F14379).

LOCATION

ATH 1,4, 6-8 and 16-18 are along the west shore of Portage Bay of MacKay Lake approximately 222 km northeast of Yellowknife. ATH 19-21 extend to the southeast (Fig. 8-82).

HISTORY

Henderson (1944) mapped the property as granite with the exception of the areas of ATH 1 and 8. No claims were recorded for the area prior to the ATH claims. ATH 1-8 and 16-18 were staked and registered in 1985 by A. Shearcroft. In May 1987, ATH 1, 4-8, 16-18 were transferred to Roxwell Gold Mines Ltd. who acquired ATH 19-21 from B. Weir in November of 1987.

DESCRIPTION

The belt of supracrustal rocks, up to 910 m wide in the northeast narrowing to 210 m wide in the southwest, transects the claims and occupies a topographic low. Green to black basaltic flows in the northwest overlie schistose greywacke to the southeast (DIAND assessment report 082538). The rocks strike northeast and dip steeply south. This extends the Courageous Lake-MacKay Lake volcanic belt 7.8 km further southwest than shown by Henderson (1944).

CURRENT WORK AND RESULTS

In 1987, after preliminary geological mapping confirmed the Courageous Lake-MacKay Lake volcanic belt extends onto the property, Aerodat Ltd. was contracted to fly a 400 line-km VLF EM, EM and magnetic survey. Survey results for ATH 1,4, 6-8 and 16-18 indicate that there are: a group of mafic dykes trending northeast cut by a group of mafic dykes trending north-northwest; a series of east-northeast-trending faults; bedrock resistivity lows and several conductors, some coincident with volcanic rocks and mafic dykes.

REFERENCES

Allan, R.J. and Cameron, E.M., 1973:
Uranium, zinc, lead, manganese, iron, organic matter, copper, nickel and potassium content of lake sediments, Bear-Slave Operation, District of Mackenzie; Geological Survey of Canada, Maps 9-1972 to 15-1972.

Allan, R.J., Cameron, E.M. and Durham, C.C., 1973a:
Reconnaissance geochemistry using lake sediments of a 36,000 square mile area of the northwestern Canadian Shield; Geological Survey of Canada, Paper 72-50, 70 p.

______, 1973b:
Bear-Slave Operation; *in* Report of Activities, Part A: April to October, 1972; Geological Survey of Canada, Paper 73-1A, p. 50-52.

______, 1973c:
Lake geochemistry - a low sample density technique for reconnaissance geochemical exploration and mapping of the Canadian Shield; *in* International Geochemical Exploration Symposium, Proceedings, 1972, ed. M.J. Jones; Institute of Mining and Metallurgy, p. 131-160.

Ames, P.L., 1988:
A study of the Nest property's gold bearing iron formation, Bathurst Inlet, NWT: unpublished B.Sc. Thesis, University of Western Ontario, 52 p.

Ayres, L.D., and Černy, P., 1982:
Metallogeny of granitoid rocks in the Canadian Shield; Canadian Mineralogist, v. 20., p 439-536.

Baragar, W.R.A., 1961:
The mineral industry of the District of Mackenzie, Northwest Territories; Geological Survey of Canada, Paper 61-3, 29 p.

Baragar, W.R.A. and Hornbrook, E.H., 1963:
Mineral Industry of District of Mackenzie, 1962; Geological Survey of Canada, Paper 63-9, 44 p.

Baragar, W.R.A. and McGlynn, J.C., 1976:
Early Archean basement in the Canadian Shield: a review of the evidence; Geological Survey of Canada, Paper 76-14, 21 p.

Bau, A.F.S., Goff, S.P. and Yakey, M.J., 1979:
Preliminary geology of NTS 86 H/9, 10, 11; NWT Geology Division, DIAND, EGS 1979-2.

Bostock, H.H., 1980:
Geology of Itchen Lake area; Geological Survey of Canada, Memoir 391, 101 p.

Boyle, R.W, 1961:
The geology, geochemistry and origin of gold deposits of the Yellowknife District, Northwest Territories; Geological Survey of Canada, Memoir 310, 193 p.

Brophy, J.A., 1986:
Geology of the Lower Crestaurum Formation in the Fred Henne Park Area, NTS 85 J/8; NWT Geology Division, DIAND, EGS 1986-13.

Brown, I.C., 1949:
Structure of the Yellowknife gold belt, NWT; unpublished Ph.D. Thesis, Harvard University.

Bryan, M.P.D., Padgham, W.A., Jefferson, C.W., Shegelski, R.J., Roneyne, E.A. and Vandor, H.L., 1976:
Preliminary geology of NTS 76 F/9, part of the Hackett River Volcanic Belt; NWT Geology Division, DIAND, EGS 1976-5.

Campbell, F.H.A. and Cecile, M.P., 1976:
Geology of the Kilohigok Basin; Geological Survey Canada, Open File 332.

______, 1981:
Evolution of the early Proterozoic Kilohigok Basin, Bathurst Inlet-Victoria Island, Northwest Territories; *in* Proterozoic Basins of Canada, ed. F.H.A. Campbell; Geological Survey of Canada, Paper 81-10, p. 103-131.

Comeau, R.L., 1990:
Tundra Gold Venture, Northwest Territories; an update, Total Energold Corporation, Toronto, Ontario.

Comeau, R.L., Kemp, R. and Powers, D.H.R., 1987:
Tundra Gold Venture, Northwest Territories, an update, Noranda Exploration Co. Ltd., Paper presented at the 93rd Annual Northwest Mining Association Convention Spokane, Washington, Dec. 5, 1987.

Covello, L., Roscoe, S.M., Donaldson, J.A. Roach, D. and Fyson, W.K., 1988:
Archean quartz arenite and ultramafic rocks at Beniah Lake, NWT; *in* Current Research, Part C, Geological Survey of Canada Paper 88-1C, p. 223-232.

Cullen, R.D., 1986:
Geology of Fenton Lake area, part of the Cameron River volcanic belt, parts of NTS 85 I/15 and 85 P/2; NWT Geology Division, DIAND, EGS 1986-10.

______, 1987:
Geology and structure of the Cameron River Belt, Fenton Lake area, parts of NTS 85 I/15, P/2; NWT Geology Division, DIAND, EGS 1987-3.

Curry, J.D., 1981:
The geology of the JAX Claim Group, Courageous-Matthews Lakes area, NWT, unpublished B.Sc. Thesis, Queen's University.

Darnley, A.G., 1973:
The use of total radioactivity measurements for reconnaissance air-borne surveys; *in* Report of Activities, Part A: April to October, 1972; Geological Survey of Canada, Paper 73-1A, p. 79-80.

Darnley, A.G. and Grasty, R.L., 1972:
Six radioactivity maps and profiles of 61 flight lines from a gamma-ray spectrometer survey of an area east and northeast of Fort Smith, NWT; Geological Survey of Canada, Open File 1010.

Davidson, A., 1972:
Granite Studies in the Slave Province; Geological Survey of Canada, Paper 72-1A, p. 109-115.

Dillon-Leitch, H.C.H., 1979:
Preliminary geology of northern Courageous Lake area, parts of NTS 76 D/3, 6; NWT Geology Division, DIAND, EGS 1979-7.

______, 1981:
Volcanic stratigraphy, structure and metamorphism in the Courageous-MacKay Lake Greenstone Belt, Slave Province, NWT; unpublished M.Sc. Thesis, University of Ottawa, 169 p.

______, 1984:
Geology of the Courageous Lake - MacKay Lake Greenstone Belt, NWT, parts of the NTS 75 M/14,15; 76 D/2,3,4,6; NWT Geology Division, DIAND, EGS 1984-4.

Douglas, R.J.W., Norris, A.W. and Norris, D.K, 1972:
Geology of the Horn River; Geological Survey of Canada, Map 1372A.

Dudek, D., 1988:
Bear Project, Sunrise Lake; NWT Geology Division, DIAND, Exploration Overview 1988, p 25 abstract.

Easton, R.M. and Jackson, V., 1981:
Geology of the Walsh Lake area NTS 85 J/9; NWT Geology Division, DIAND, EGS 1981-3.

Easton, R.M., Ellis, C., Dean, M., Bailey, G., Bruneau, H.C. and Wahlroth, J., 1982a:
Geology of the Typhoon Point area, High Lake Greenstone Belt, NTS 76 M/10, and part of 76 M/15; NWT Geology Division, DIAND, EGS 1982-6.

Easton, R.M., Ellis, C., Helmstaedt, H., Jackson, V., O'Hearn, B., Dean, M., Bruneau, H.C. and Wahlroth, J., 1982b:
Geology of the east side of Yellowknife Bay, NTS 85 J/8,9; NWT Geology Division, DIAND, EGS 1982-5.

Folinsbee, R.E., 1949:
Geology, Lac de Gras, District of Mackenzie, NWT; Geological Survey of Canada, Map 977A.

Folinsbee, R.E. and Moore, J.C.G., 1950:
Matthews Lake, Northwest Territories; Geological Survey of Canada, Paper 50-2.

Fortier, Y.O., 1947:
Preliminary Map, Ross Lake, Northwest Territories; Geological Survey of Canada, Paper 47-16.

______, 1949:
Indin Lake (east half) map area, NWT; Geological Survey of Canada, Paper 49-10.

Fraser, J.A., 1964:
Geological notes on northeastern District of Mackenzie, NWT; Geological Survey of Canada, Paper 6-40, 20 p.

Fraser, J.A., Heywood, W.W. and Mazurski, M.A., 1978:
Metamorphic map of the Canadian Shield; Geological Survey of Canada, Map 1475A.

Frith, R.A., 1978:
Tectonics and metamorphism along the southern boundary between the Bear and Slave Structural Province; *in* Metamorphism in the Canadian Shield, eds. J.A. Fraser and W.W. Heywood; Geological Survey of Canada, Paper 78-10, p. 103-113.

______, 1981a:
Geology of Nose Lake (76H, east half) and Beechey Lake (76 G, west half), District of Mackenzie, NWT; Geological Survey of Canada, Open File 785.

______, 1981b:
A preliminary map of the Beechey Lake (76 G, east half) and Duggan Lake (76 H, west half) map areas, District of Mackenzie; Geological Survey of Canada, Open File 851.

______, 1981c:
Preliminary account of the geology of the Beechey Lake - Duggan Lake map areas, District of Mackenzie; *in* Current Research, Part A; Geological Survey Canada, Paper 81-1A, p. 333-339.

______, 1986:
Precambrian Geology of the Indin Lake map area, NTS 86B, District of Mackenzie; Geological Survey of Canada, Open File 1243.

Frith, R.A., and Hill, J.D., 1975:
The geology of the Hackett-Back River Greenstone Belt - preliminary account; *in* Report of Activities, Part C; Geological Survey of Canada, Paper 75-1C, p. 367-370.

Frith, R.A. and Loveridge, W.D., 1982:
Ages of Yellowknife deposition, granitoid intrusion and regional metamorphism in the northeastern Slave Structural Province, Geological Survey of Canada, Paper 82A, p. 225-237.

Frith, R.A., and Percival, J.A., 1978:
Stratigraphy of the Yellowknife Supergroup in the Mara-Back Rivers areas, District of Mackenzie; *in* Current Research, Part C; Geological Survey of Canada, Paper 78-1C, p. 89-98.

Frith, R.A. and Roscoe, S.M., 1980:
Tectonic setting and sulphide deposits of the Hackett River Belt, Slave Province; The Canadian Minerals and Metallurgy Bulletin, v. 73, no. 815, p. 143-153.

Fyson, W.K., 1980:
Fold fabrics and emplacement of an Archean granitoid pluton, Cleft Lake, NWT; Canadian Journal of Earth Science, v. 17, no. 3, p. 325-332.

______, 1981:
Divergent fold overturning and regional tectonics, southern Slave Province, NWT; Precambrian Research, v. 14, no. 2, p. 107-118.

______, 1982:
Complex evolution of folds and cleavages in Archean rocks, Yellowknife, NWT; Canadian Journal of Earth Science, v. 19, no. 4, p. 878-893.

______, 1987:
Guide to structures in metasedimentary rocks, *in* Field Guide, Yellowknife Mining District, W.A. Padgham ed., The Yellowknife Geo-workshop Committee, p. 89-97.

Fyson, W.K. and Frith, R.A., 1979:
Regional deformations and emplacement of granitoid plutons in the Hackett River Greenstone Belt, Slave Province, NWT; Canadian Journal of Earth Science, v. 16, no. 6, p. 1187-1195.

Gibb, R.A., and Thomas, M.D., 1980:
Correlation of gravity anomalies with Yellowknife Supergroup rocks, North Arm, Great Slave Lake,; Canadian Journal of Earth Sciences, v. 17, p 1506-1516.

Gibbins, W.A., 1981:
Gold and Precambrian iron-formation in the NWT; *in* Proceedings of the Gold Workshop, R.D. Morton, ed., Yellowknife, NWT, Dec. 3-7, 1979, pp. 256-287.

______, 1987a:
Geology of the Hope Bay Volcanic Belt, Northeast Slave Province, NWT, Abstracts Geological Association of Canada - Yellowknife '87 Summer Field Meeting.

______, 1987b:
Geology of the Hope Bay Volcanic Belt; NWT Geology Division, DIAND, EGS 1987-12.

Gibbins, W.A. and Hogarth, D.D., 1986:
High magnesium komatiitic peridotite from Hope Bay; Abstracts Geological Association of Canada - Annual Meeting, v. 1, p. 72.

Gibbins, W.A., Seaton, J.B., Laporte, P.J., Murphy, J.D., Hurdle, E.J. and Padgham, W.A., 1977:
Mineral Industry Report, 1974, Northwest Territories; NWT Geology Division, DIAND, EGS 1977-5, 267 p.

Hauer, L.M., 1979:
Preliminary geology map of the northern end of the Yellowknife Greenstone Belt, parts of 85 J/9; NWT Geology Division, DIAND, EGS 1979-10.

Helmstaedt, H., Goodwin, J.A., Patterson, J.G., King, J., 1979:
Preliminary geology of the southern end of the Yellowknife Greenstone Belt, parts of NTS 85 J/7, 8; NWT Geology Division, DIAND, EGS 1979-9.

Helmstaedt, H., King, J. and Boodle, R., 1980:
Preliminary geology map of Banting and Walsh Lakes area, 85 J/9; NWT Geology Division, DIAND, EGS 1980-5.

Helmstaedt, H., Bell, R., Ellis, C.E., Howson, S., Jackson, V.A. and Relf, C., 1985:
Geology of the Sito Lake area, NTS 85 J/16; NWT Geology Division, DIAND, EGS 1985-10.

Helmstaedt, H., and Padgham, W.A., 1986:
A new look at the stratigraphy of the Yellowknife Supergroup at Yellowknife, NWT-implications for the age of gold bearing shear zones and Archean basin evolution; Canadian Journal of Earth Sciences, v. 23, p 454-475.

Henderson, J.B., 1970:
Stratigraphy of the Yellowknife Supergroup, Yellowknife Bay-Prosperous Lake area, District of Mackenzie; Geological Survey of Canada, Paper 70-26, 12 p.

______, J.B., 1972:
Sedimentology of Archean turbidites at Yellowknife, NWT; Canadian Journal of Earth Science, v. 9, no. 7, 882-902.

______, 1975a:
Archean stromatolites in the northern Slave Province, NWT, Canadian Journal of Earth Science, v. 12, no. 9, p. 1619-1630.

______, 1975b:
Sedimentology of the Archean Yellowknife Supergroup at Yellowknife, District of Mackenzie; Geological Survey of Canada, Bulletin 246, 62 p.

______, 1976:
Geology of Hearne Lake (85 I) and Yellowknife (85 J) map areas; Geological Survey of Canada, Open File 353.

______, 1978:
Age and origin of the gold-bearing shear zones at Yellowknife, NWT; *in* Current Research, Part A; Geological Survey of Canada, Paper 78-1A, p. 259-262.

______, 1981:
Archean basin evolution in the Slave Province, *in* Precambrian Plate Tectonics, Developments in Precambrian Geology 4, ed., A. Kroner; Elsevier, Amsterdam, p. 213-235.

______, 1985:
Geology of Yellowknife-Hearne Lake area, District of Mackenzie: a segment across an Archean basin; Geological Survey of Canada, Memoir 414, 135 p.

Henderson, J.B. and Easton, R.M., 1977a:
Archean supracrustal-basement rock relationships in the Keskarrah Bay map-area, Slave Structural Province; Geological Survey of Canada, Open file 447.

______, 1977b:
Archean supracrustal-basement rock relationships in the Keskarrah Bay map-area, Slave Structural Province, District of Mackenzie; *in* Report of Activities, Part A; Geological Survey of Canada, Paper 77-1A, p. 217-221.

Henderson, J.B. and Thompson, P.H., 1980:
The Healey Lake map area (northern part) and the enigmatic Thelon Front; *in* Current Research, Part A; Geological Survey of Canada, Paper 80-1A, p. 165-169.

Henderson, J.F., 1941:
Geology, Gordon Lake, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 644A.

______, 1941:
Geology, Gordon Lake South, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Map 645A.

______, 1944:
Geology, MacKay Lake, NWT; Geological Survey of Canada, Map 738A.

Henderson, J.F. and Brown I.C., 1966:
Geology and structure of the Yellowknife Greenstone Belt, District of Mackenzie; Geological Survey of Canada, Bulletin 141, 87 p.

Henderson, J.F., and Jolliffe, A.W., 1941:
Beaulieu River, Northwest Territories; Geological Survey of Canada, Map 581A.

Heywood, W.W. and Davidson, A., 1969:
Geology of Benjamin Lake map-area, District of Mackenzie (75 M/2); Geological Survey of Canada, Memoir 361, 35 p.

Hurdle, E., 1983:
Geology of a volcanic pile at Clan Lake, NWT, NTS 85 J/15,16; NWT Geology Division, DIAND, EGS 1983-5.

______, 1984:
Geology of a volcanic pile at Clan Lake, NWT; *in* Contributions to the geology of the Northwest Territories v. 1, NWT Geology Division, DIAND, p. 79-90.

______, 1986:
Stratigraphy, structure and metamorphism of Archean rocks, Clan Lake, Northwest Territories, unpublished M.Sc. Thesis, University of Ottawa, 148 p.

Hurdle, E.J., and Gibbins, W.A., 1978:
Operating Mines: Mineral Industry Report, 1975, Northwest Territories; NWT Geology Division, DIAND, EGS 1978-6, p. 109-117.

Hutchinson, R.W., 1955:
Regional zonation of pegmatites near Ross Lake, District of Mackenzie, Northwest Territories: Geological Survey of Canada, Bulletin 34, 30 p.

Jackson, V.A., 1987:
Geology of the Russell Lake Area; NTS 85 O/4; NWT Geology Division, DIAND, EGS 1987-11.

______, 1988:
Geology of the Russell-Slemon Lakes area, NTS 85 O/4; NWT Geology Division, DIAND, EGS 1988-11.

Jackson, V.A., Bell, R.M., Howson, S.H. and Kerr, D.E., 1986a:
Geology of the north end of Russell Lake, part of NTS 85 O/4; NWT Geology Division, DIAND, EGS 1986-11.

Jackson, V.A., Kerr, D., Bell, R., Howson, S. and Bailey, G., 1986b:
Preliminary geology of the Hood River area, NTS 76 L/10,15,16; NWT Geology Division, DIAND, EGS 1986-14.

Jackson, V.A., Bailey, G., Bell, R., Bishop, S., Crux, J.C.E., Daniels, A., Howson, S., Kerr, D., Manicotti, C., Relf, C., Treganza, M. and Wahlroth, J., 1986c:
Geology of the Quyta Lake area, parts of NTS 85 J/9,16; NWT Geology Division, DIAND, EGS 1986-2.

James, D.T., 1985:
Geology of the Moraine Lake area and the Thelon Front, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 85-1A, p. 449-454.

______, 1986:
Geology of the Moraine Lake area, District of Mackenzie, Part 2: a transect across part of the Thelon Tectonic Zone; *in* Current Research, Part A; Geological Survey of Canada, Paper 86-1A, P. 417-421.

Jefferson, C.W., Padgham, W.A., Bryan, M.P.D., Shegelski, R.J., Ronayne, E.A., Vandor, H.L. and Thorstad, L.E., 1976:
Preliminary geology of NTS 76 K/2, part of the Hackett River Volcanic Belt; NWT Geology Division, DIAND, EGS 1976-4.

Johnson, W.L., 1974:
Geology of two base metal deposits in the Slave Structural Province (High Lake copper-zinc deposit, NTS 76 M/7 and Indian Mountain Lake zinc-lead-silver-copper deposit, NTS 75 M/2); Geological Survey of Canada, Open File 239.

Jolliffe, A.W., 1936:
Yellowknife River area, NWT, Geological Survey of Canada, Paper 36-5, 10 p.

______, 1938:
Yellowknife Bay-Prosperous Lake areas, NWT; Geological Survey of Canada, Paper 38-21.

______, 1939:
Preliminary Maps, Quyta Lake and parts of Fishing Lake and Prosperous Lake Area, Northwest Territories; Geological Survey of Canada, Paper 39-8.

______, 1940:
Quyta lake and Parts of Fishing Lake and Prosperous Lake Area, Northwest Territories; Geological Survey of Canada, Paper 40-14.

______, 1942:
Yellowknife Bay, NWT; Geological Survey of Canada, Map 709A.

______, 1944:
Rare element minerals in pegmatites, Yellowknife-Beaulieu area, NWT; Geological Survey of Canada, Paper 44-12, 24 p.

______, 1946:
Geology, Prosperous Lake, NWT; Geological Survey of Canada, Map 868A.

King, J.E., 1982:
Low-pressure regional metamorphism and progressive deformation in the eastern Point Lake area, Slave Province, NWT; unpublished M.Sc. Thesis, Queen's University, 167 p.

King, J.E., Davis, W.J., Relf, C. and Avery, R.W., 1988:
Deformation and plutonism in the western Contwoyto Lake map area, central Slave Province, District of Mackenzie, NWT; *in* Current Research, Part C, Geological Survey of Canada, Paper 88-1C, p. 161-176.

Kretz, R, 1968:
Study of pegmatite bodies and enclosing rocks, Yellowknife Beaulieu regions, District of Mackenzie; Geological Survey of Canada, Bulletin 159, 109 p.

Lambert, M.B., 1977:
Anatomy of a greenstone belt, Slave Province, NWT; *in* Volcanic Regimes in Canada, A Symposium, University of Waterloo, May 16-17, 1975; eds. W.R.A. Beragar and others; Geological Association of Canada, Special Paper 16, p. 331-340.

______, 1978:
The Back River volcanic complex - a cauldron subsidence structure of Archean Age; *in* Current Research, Part A; Geological Survey of Canada, Paper 78-1A, p. 153-157.

______, 1981:
The Back River volcanic complex, District of Mackenzie, NWT; Geological Survey of Canada, Open File 848.

______, 1982:
Synvolcanic intrusions in the Cameron River volcanic belt, District of Mackenzie, *in* Current Research part A, Geological Survey of Canada, Paper 82-1A, p. 165-167.

______, 1988:
Cameron River and Beaulieu River Volcanic belts of the Archean Yellowknife Supergroup, District of Mackenzie, Northwest Territories, Geological Survey of Canada Bulletin 382, 145 p.

Lasmanis, R., 1978:
Lithium resources in the Yellowknife area, Northwest Territories, Canada; Energy, v. 3, p. 399-407.

Little, R.N., 1985
Structural and Petrographic study of Sito Lake, NWT; unpublished B.Sc. Thesis, Queen's University, 110 p.

Lord, C.S., 1941:
Mineral Industry of the NWT, Geological Survey Canada, Memoir 230, 136 p.

______, 1942:
Snare River and Ingray Lake map-areas, NWT; Geological Survey of Canada, Memoir 235, 55 p.

______, 1951:
Mineral Industry of District of Mackenzie, NWT; Geological Survey of Canada, Memoir 261, 336 p.

Lord, C.S. and Barnes, F.Q., 1954:
Geology Aylmer Lake, District of Mackenzie, NWT; Geological Survey of Canada, Map 1031A.

McGlynn, J.C., 1963:
Arseno Lake map-area, District of Mackenzie, Geological Survey of Canada, Paper 63-26, 7 p.

______, 1971:
Metallic Mineral Industry, District of Mackenzie, NWT; Geological Survey of Canada, Paper 70-17, 194 p.

______, 1977:
Geology of Bear-Slave Structural Province, District of Mackenzie; Geological Survey of Canada, Open File 445.

McGlynn, J.C. and Henderson, J.B., 1970:
Archean volcanism and sedimentation in the Slave Structural Province; *in* Symposium on Basins and Geosynclines of the Canadian Shield, ed. A.J. Baer; Geological Survey of Canada, Paper 70-40, p. 31-44.

______, 1972:
The Slave Province; *in* Variations in Tectonic Styles in Canada, eds. R.A. Price and P.J.W. Douglas; Geological Association of Canada, 25th Anniversary Volume, Special Paper 11, p. 505-526.

McGlynn, J.C. and Ross, J.V., 1962:
Geology Basler Lake, District of Mackenzie; Geological Survey of Canada, Map 19-1962.

Meintzer, R.E., Wise, M.A. and Cérny, P., 1984:
Distribution and structural setting of fertile granites and related pegmatites in the Yellowknife pegmatite field, District of Mackenzie; *in* Current Research, Part A; Geological Survey of Canada, Paper 84-1A, p. 373-381.

Moore, J.C.G., 1951:
Courageous Lake, Northwest Territories; Geological Survey of Canada, Paper 51-14.

______, 1956:
Courageous-Matthews Lakes area, District of Mackenzie, NWT; Geological Survey of Canada, Memoir 283, 52 p.

Moore, J.C.G., Miller, M.L. and Barnes, F.Q., 1951:
Second preliminary map, Carp Lakes, NWT; Geological Survey of Canada, Paper 51-8.

Morgan, J., 1988:
Mineral Occurrences of the Indin Lake Area (north half) parts of NTS 86 B/3,6; Canada-NWT MDA, NWT Geology Division, DIAND, EGS 1988-8.

Mulligan, R., 1965:
Geology of Canadian Lithium deposits; Geological Survey of Canada, Economic Geology Report No. 21, 131 p.

Nielsen, P.A., 1978:
Metamorphism of the Arseno Lake area, NWT; *in* Metamorphism in the Canadian Shield, eds., J.A. Fraser and W.W. Heywood; Geological Survey of Canada, Paper 78-10, p. 115-122.

Padgham, T., Caine, T.W., Hughes, D.R., Jefferson, C.W., Kennedy, M.W. and Murphy, J.D., 1976:
Mineral Industry Report, 1969 and 1970, Northwest Territories west of 104° West longitude, v. 3; NWT Geology Division, DIAND, EGS 1976-6, 166 p.

Padgham, W.A., 1981:
Archean Crustal Evolution - A glimpse from the Slave Province: *in* Glover, J.E. and Groves, D.I., eds., Archaean Geology, Second International Archaean Symposium: Geological Society of Australia, Special Publication 7, p. 99-110.

______, 1984:
Gold deposits of the NWT; Classes, styles, genesis, exploration methods, and success probabilities; *in* Contributions to the Geology of the NWT, J.A. Brophy, ed., v. 1, p. 121-129.

______, 1985:
Turbidite hosted gold quartz veins in the Slave Province, NWT, Geological Association of Canada Special Paper 32, p. 119-134.

______, 1987:
Yellowknife Volcanic Belt: Setting and Stratigraphy; *in* Field Guide, Yellowknife Mining District, W.A. Padgham, ed., The Yellowknife Geo-workshop Committee, p. 11-20.

Padgham, W.A., Kennedy, M.W., Jefferson, C.W., Hughes, D.R. and Murphy, J.D., 1975:
Mineral Industry Report, 1971 and 1972, v. 3 of 3, Northwest Territories west of 104° West longitude; NWT Geology Division, DIAND, EGS 1975-8, 220 p.

Padgham, W.A., Laporte, P.J., Murphy, J.D. and Seaton J.B, 1976:
Mineral Industry Report, 1973, Northwest Territories; NWT Geology Division, DIAND, EGS, 1976-9, 211 p.

Padgham, T., Caine, T.W., Hughes, D.R., Jefferson, C.W., Kennedy, M.W. and Murphy, J.D., 1976:
Mineral Industry Report, 1969 and 1970, Northwest Territories west of 104° West longitude, v. 3; NWT Geology Division, DIAND, EGS 1976-6, 166 p.

Pelletier, K.S. and Wahlroth, J.M., 1986:
Geology of the southwestern Yellowknife Bay area, parts of the NTS 85 J/7, 8; NWT Geology Division, DIAND, EGS 1986-12.

Percival, J.A., 1979:
Kyanite-bearing rocks from the Hackett River area, NWT: Implications for Archean geothermal gradients; Contributions to Mineralogy and Petrology, v. 69, p. 177-184.

Ransom, A.H. and Robb, M.E., 1986:
The Salmita Gold Deposit, *in* Gold in the Western Shield, ed. L.A. Clark; CIMM Special Volume 38, p. 285-305.

Relf, C. and Nicholson, D.C., 1986a:
Geology of the West Mirage Islands, NWT, parts of NTS 85 J/7,8; NWT Geology Division, DIAND, EGS 1986-5.

Relf, C. and Nicholson, D.C., 1986b:
Geology of the East Mirage Islands, NWT, parts of NTS 85 J/1,8; NWT Geology Division, DIAND, EGS 1986-15.

Riddle, J.E., 1939:
Report on S.D.C. Group, Pensive Lake area, NWT; private report to Dome Mines Ltd.

Richardson, K.A., Holman, P.B. and Charbonneau, B.W., 1973:
Seven radioactivity maps (1:250,000) and profiles of flight lines (1:500,000) of a gamma-ray spectrometer survey of Winter Lake, Indian Lake, Hardesty Lake, Calder River, Redrock Lake and Point Lake map-areas, Northwest Territories; Geological Survey of Canada, Open File 140.

Richardson, K.A., Holman, P.B. and Elliott, B., 1974:
Airborne radioactivity maps (1:250,000) and profiles of 24 flight lines (1:250,000) of Marian River, Wecho River, Carp Lakes and MacKay Lake map-areas, Northwest Territories; Geological Survey of Canada, Open File 188.

Roach, D., 1988:
Geology of the Southeast part of Yellowknife Bay, part of NTS 85 J/8; NWT Geology Division, DIAND, EGS 1988-2.

______, 1989:
Preliminary geology of the Beniah Lake Area; NTS 85 P/8; NWT Geology Division, DIAND, EGS 1989-9.

Roscoe, S.M., 1985:
The Booth River Intrusive Suite, District of Mackenzie; *in* Current Research, Part A, Geological Survey of Canada, Paper 85-1A, p. 141-144.

Roscoe, S.M., Staargaard, C.F., and Fraser, S., 1988:
Stratigraphic setting of gold concentrations in Archean supracrustal rocks near the west side of Bathurst Inlet, NWT; *in* Current Research, Geological Survey of Canada, Paper 88-1C, p. 367-372.

Ross, J.V., 1966:
The structure and metamorphism of Mesa Lake map area, 86 B/14 (west half); Geological Survey of Canada, Bulletin 124, 39 p.

Rowe, R.B., 1952:
Pegmatitic mineral deposits of the Yellowknife-Beaulieu region, District of Mackenzie, NWT; Geological Survey of Canada, Paper 52-8, 36 p.

Schiller, E.A., 1965:
Mineral Industry of the Northwest Territories, 1964; Geological Survey of Canada, Paper 65-11, 62 p.

Schiller, E.A. and Hornbrook, E.H., 1964:
Mineral Industry of District of Mackenzie, 1963; Geological Survey of Canada, Paper 64-22, 43 p.

Seaton, J.B., 1978:
The Mackenzie region: The Slave Province; *in* Mineral Industry Report, 1975, Northwest Territories; NWT Geology Division, DIAND, EGS 1978-5, p. 53-90.

______, 1983a:
Slave Structural Province; *in* Mineral Industry Report, 1978, Northwest Territories; NWT Geology Division, DIAND, EGS 1983-2, p. 109-128.

______, 1983b:
Slave Structural Province; *in* Mineral Industry Report, 1979, Northwest Territories; NWT Geology Division, DIAND, EGS 1983-9, p. 217-243.

______, 1984:
Slave Structural Province; *in* Mineral Industry Report, 1980/81, Northwest Territories; NWT Geology Division, DIAND, EGS 1984-5, p. 333-408.

Seaton, J.B., Brophy, J.A., and Crux, J.C., 1987:
Slave Structural Province; *in* Mineral Industry Report, 1984-85, Northwest Territories; NWT Geology Division, DIAND, p. 181-270.

Seaton, J.B. and Crux, J.C., 1985:
Slave Structural Province; *in* Mineral Industry Report, 1982-83, Northwest Territories; NWT Geology Division, DIAND, EGS 1985-4, p. 287-361.

Seaton, J.B. and Hurdle, E.J., 1978:
The Slave Structural Province; *in* Mineral Industry Report, 1976, Northwest Territories; NWT Geology Division, DIAND, EGS 1978-11, p. 80-102.

Smith, P.H., 1963:
Geology, Mattbury Lake; Geological Survey of Canada, Map 44-1963.

Stanton, M.S., Tremblay, L.P. and Yardley, D.H., 1954:
Chalco Lake, NWT; Geological Survey of Canada, Map 1028A.

Stockwell, C.H., 1933:
Great Slave Lake-Coppermine river area, NWT; *in* Summary Report 1932, Part C; Geological Survey of Canada, p. 37-63.

Stockwell, C.H., Brown, I.C., Barnes, F.Q. and Wright, G.M., 1968:
Geology, Christie Bay, District of Mackenzie; Geological Survey of Canada, Map 1122A.

Stokes, T., Culshaw, N.and Zentilli, M., 1988:
Structural mapping of the Gordon Lake 'Refold', NWT: a model for the focusing of late-stage gold bearing quartz breccia-vein systems, part of NTS 85 I/15 and 85 P/3; Canada-NWT MDA, NWT Geology Division, DIAND, EGS 1988-4, 28 p.

Stokes, T., Zentilli, M. and Culshaw, N., 1989:
A Structural and lithologic model for the formation of gold bearing quartz breccias at Gordon Lake, NWT 85 I/15 & 85 P/3; Canada-NWT MDA, NWT Geology Division, DIAND, EGS 1989-17.

Stubley, M., 1989:
Preliminary geology of the Spencer Lake Area; parts of NTS P/1,2; Canada-NWT MDA, NWT Geology Division, DIAND, EGS 1989-12.

Thompson, P.H., 1979:
Archean regional metamorphism in the Slave Structural Province - a new perspective on some old rocks; *in* Metamorphism in the Canadian Shield, eds. J.A. Fraser and W.W. Heywood; Geological Survey of Canada, Paper 78-10, p. 85-102.

______, 1986:
Proterozoic and Archean Geology of the Tinney Hills (76J) - Overby Lake (76I, west half) map areas, District of Mackenzie, Geological Survey of Canada, Open File 1316.

Thompson, P.H. and Ashton, K., 1984:
Preliminary report on the geology of the Tinney Hills-Overby Lake (west half) map area, District of Mackenzie: a look at tthe Thelon Tectonic Zone northeast of the Bathurst Fault; *in* Current Research, Geological Survey of Canada, Paper 84-1A, p. 415-423.

Thompson, P.H. and Culshaw, N., 1985:
Tinney Hills map area, District of Mackenzie; Geological Survey of Canada, Open File 1155.

Thompson, P.H., Culshaw, N., Buchanan, J.R. and Manojlovic, P., 1986:
Geology of the Slave Province and Thelon Tectonic Zone in the Tinney Hills-Overby Lake (west half) map area, District of Mackenzie; *in* Current Research, Geological Survey of Canada, Paper 86-1A, p. 275-289.

Thompson, P.H., Culshaw, N., Thompson, D.L. and Buchanan, J.R., 1985:
Geology across the western boundary of the Thelon Tectonic Zone in the Tinney Hills-Overby Lake (west half) map area, District of Mackenzie; *in* Current Research, Geological Survey of Canada, Paper 85-1A, p. 555-572.

Thorpe, R.I., 1966:
Mineral Industry of the NWT, 1965; Geological Survey of Canada, Paper 66-52, 66 p.

______, 1972:
Mineral exploration and mining activities, mainland NWT, 1966 to 1968 (excluding the Coppermine River area); Geological Survey of Canada, Paper 70-70, 240 p.

Tremblay, L.P., 1952:
Giauque Lake, District of Mackenzie, Northwest Territories; Geological Survey of Canada, Memoir 266, 74 p.

______ 1976:
Geology of northern Contwoyto Lake area, District of Mackenzie; Geological Survey of Canada, Memoir 381, 56 p.

Tremblay, L.P., Wright, G.M. and Miller, M.L., 1953:
Ranji Lake, District of Mackenzie, NWT; Geological Survey of Canada, Paper 53-10, 23 p.

Vivian, G., Covello, L., Bryan, D., 1988:
The geology of the Sunrise Ag-Zn-Pb massive sulphide deposit, Beaulieu River Volcanic Belt; 1988 Overview, NWT Geology Division, DIAND, p. 41.

Wise, M.A., Meintzer, R.E. and Cěrny, P., 1985:
The Yellowknife pegmatite field: mineralogy and geochemistry of Nb-Ta-Sn oxide minerals; *in* Contributions to the Geology of the Northwest Territories, v. 2, NWT Geology Division, DIAND, EGS 1985-6, p. 15-25.

Wright, G.M., 1954:
Ghost Lake, District of Mackenzie, NWT, Geological Survey of Canada, Map 1021A.

Yardley, D.H., 1949:
Preliminary Map, Wecho river (east half)., Northwest Territories; Geological Survey of Canada, Paper 49-14.

Yeo, G.M., Bailey, G., Crux, J., Fischer, B. Jackson, V., Relf, C. and Wahlroth, J., 1983:
Preliminary geology of Quyta Lake area NWT, NTS 85 J/9,16; NWT Geology Division, DIAND, EGS 1983-7.

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